

JOURNAL OF THE ROYAL INSTITUTE OF BRITISH ARCHITECTS

THIRD SERIES

VOL. 46. No. 5

9 JANUARY 1939

CONTENTS FOR 9 JANUARY 1939

	Page
HENRY HOLLAND	Frontispiece
JOURNAL	215
RECENT SWEDISH ARCHITECTURE	217
MUNICIPAL SMALL HOUSES IN SWEDEN	223
DRAWINGS FOR THE HOUSES OF PARLIAMENT BY WILLIAM KENT, 1739	228
HOSPITAL LIBRARIES	232
THE INSTITUTE'S APPEAL: DONATIONS AND SUBSCRIPTIONS	236
A.R.P.: THE INFORMAL GENERAL MEETING, 14 DECEMBER	238
REVIEW OF CONSTRUCTION AND MATERIALS	242
 BOOK REVIEWS:	
MUSEUMS OF THE BRITISH ISLES. Sir Cyril Fox	244
ESTATE DEVELOPMENT. C. B. P.	245
NINETEENTH CENTURY TOWN PLANS IN JUGOSLAVIA	246
SMALL DUTCH HOUSES. H. C. Hughes [F.]	246
A TEXT-BOOK FOR ENGINEERS	246
STEELWORK TABLES AND DATA	246
THE BIRMINGHAM CIVIC SOCIETY	246
A CHEAP EDITION OF SIR HERBERT BAKER'S BOOK ON RHODES.. .. .	246
REVIEW OF PERIODICALS	247
ACCESSIONS TO THE LIBRARY—V	249
GENERAL KNOWLEDGE PAPER: ANSWERS	251
 CORRESPONDENCE:	
A.B.S. APPEAL. B. N. Solly	253
A.B.S. 4d. A HEAD	253
THE BUILDING INDUSTRY. O. W. Roskill	254
THE "NASH" ENGRAVING. John Purser	254
DESIGN OF WINDOW OPENINGS. P. J. Waldram [L.]	254
 OBITUARIES:	
ARTHUR KEEN. Stanley Hall [F.], G. Alan Fortescue [F.]	255
CHARLES SPOONER	256
A. E. STREET	256
J. H. HEYWOOD	257
A. E. POWLES	257
A. J. PICTOR	257
F. HALL-JONES	257
E. L. GAUNT	257
W. F. EDWARDS	257
NOTES	258
PROBATIONERS	260
NOTICES	260
COMPETITIONS	262
MEMBERS' COLUMN	263
ARCHITECTS' AND SURVEYORS' APPROVED SOCIETY	264
ARCHITECTS' BENEVOLENT SOCIETY	264



The late HENRY HOLLAND, Esq.
View Hans Place

Henry Holland, 1746?-1806. Architect of Claremont, Carlton House, Brooks's Club House, etc. In 1780 Holland purchased a hundred acres in Chelsea as a speculation, laid out Sloane Street, Cadogan Place and Hans Place, building his own villa there, which is seen in the picture above. From an etching recently purchased by the library

JOURNAL OF THE ROYAL INSTITUTE *of* BRITISH ARCHITECTS

VOL. 46 3RD SERIES

9 JANUARY 1939

No. 5

Journal

NEW YEAR'S HONOURS

Mr. H. S. E. Vanderpant [*Hon. A.*] has been made a Knight Bachelor in the New Year's Honours List, Mr. Herbert Ryle, M.V.O., O.B.E. [*A.*], of H.M. Office of Works, has been made C.V.O., and Mr. W. L. Eves [*F.*], architect to the Uxbridge Urban District Council, has been made M.B.E. Mr. Vanderpant's honour was given chiefly as tribute to his work as chairman of the London and Home Counties Traffic Advisory Committee, but we can express our pleasure that such a good friend of architects and the R.I.B.A. should by proxy, as it were, help Mr. Eves and Mr. Ryle to hold up the distinction of architecture in a list which, as *The Times* remarked, gave a share of honour to the arts which was "meagre in the extreme."

NATIONAL EMERGENCY

The Minister of Labour has set up a central bureau which will, in the event of a national emergency, be responsible for supplying both in the Government services and elsewhere the additional requirements for personnel of administrative, scientific, technical and professional qualifications (excluding the medical service). He is also, in consultation with the Lord Privy Seal, appointing an Advisory Committee under the chairmanship of Sir Walter Moberly with the following terms of reference :—

To advise the Minister of Labour on the utilisation in Government Departments or elsewhere, in the event of an emergency, of personnel with scientific, technical or professional qualifications, and persons qualified for higher administrative posts.

The Committee will include representatives of the universities, the principal professional bodies, employers, the Department of Scientific and Industrial Research, and of the other Government Departments principally concerned. In response to the Minister of Labour's request, the President has nominated Mr. Thomas E. Scott [*F.*] to represent the Institute on the Advisory Committee. Mr. Scott is Chairman of the

R.I.B.A. Emergency Panel Committee and he is also Chairman of the R.I.B.A. Air Raid Precautions Committee which has just been appointed.

THE CHRISTMAS HOLIDAY LECTURES

The continued success over many years of the Christmas Holiday Lectures to Boys and Girls says much for the wise choice of lecturers that has been made. This year the lectures have been given by Mr. R. A. Duncan [*A.*], and the increased attendance at each successive lecture showed that he was at least as good as his best predecessors. His subject was "Building Buildings," and he dealt with it in three lectures under : "In Roman Times," "In the Middle Ages," and "In Modern Times." Those architectural students and ex-students who have heard Mr. Duncan lecture on the history of architecture will know that he has a knack of making the past re-live in the minds of his auditors—of relating architectural expressions to the life and events of the epochs that created them. No approach could be more suited to a lay audience ; Mr. Duncan's vast fund of knowledge, enlivened by his racy, even slangy, style, captured the interest of the children in a quite remarkable way. Even the reporter of *The Times*—the most sober and restrained of newspapers—seemed himself to have become infected with the general enthusiastic interest.

THE ISSUE OF "QUESTIONS AND ANSWERS" TO STUDENTS

In the first December JOURNAL it was announced that it had been decided to discontinue sending *Questions and Answers* to Students. In response to a vigorous plea from the Junior Members' Committee the Finance and House Committee have decided to rescind their previous decision and to send *Questions and Answers* to Students as hitherto. Subsequent to the decision not to send the leaflets one issue was published dealing with the thermal insulation of buildings. A limited number of these are in stock and will be sent free to Students who apply for them. Post-cards should be addressed to the librarian-editor.

"FOCUS"

Publication of the second number of *Focus* has turned what might have been nothing more than a journalistic *jeu d'esprit* into an affair of some importance. It is not easy, however easy it may be to have ideas on the subject, to produce a paper in the crowded world of London architectural journalism able to hold its own among the bigger, more orthodox papers which succeed tolerably well in spreading themselves over the whole field; but *Focus* with the delicacy of a precision machine spins gaily on an ideological point. Things that spin have a way of stopping either because they lose their original motive force or because the rapidity of their spinning at the start blunts their points too soon or drives them to fixity in their platforms, or perhaps because few people can stand for long the entirely humourless presentation of ideas, however inspiring. Memories of the sad Valhalla of journalistic "ephemera" from the *Yellow Book* and *The Germ* to *L'Esprit Nouveau* and *Axis* bring to mind a terrible lot of reasons why a magazine may not live for ever, and there are fewer reasons why a magazine can hope for success, but *Focus* is generously supplied with the lot: it is brilliantly edited (the number of scoops in its second number is enough to make any ordinary editor ill with pride); its physical form is neat and handy, though the page layout is a bit weak, and cashes in on the present fashion for pocket size magazines; the quality of the writing is well above the normal, though there is this danger of being too earnest and therefore humourless. There is none of the usual fear of intelligence or loyalty to an idea, indeed *Focus* flatters its readers by requiring an understanding of what it is after. It is a magazine for people inside the modern movement rather than for proselytes or protestants. It thoroughly deserves the success it has had.

THE NEXT CONCERT AT THE R.I.B.A.

An exceptionally interesting musical event will take place in the Florence Hall on Sunday, 5 February, at 8.30 p.m., when Rossini's "*Petite Messe*" will be presented under the combined auspices of the R.I.B.A. Music Group and the Opera Circle. This work was composed for four solo voices and chorus, with piano-forte and harmonium accompaniment; the first performance was given in 1865, at the mansion of Count Pillet-Will, in the rue Moncey, Paris. It is hoped, with the help of Mr. Gilbert Kendrew, Chairman of the R.I.B.A. Dramatic Society, to reproduce as far as possible in the circumstances the scene of this first performance, at which Rossini himself assisted as accompanist. Advice is being given as to *mise en scène* and costume by Mr. Goodhart-Rendel, to whose original suggestion the performance will owe its being.

The singers will be: *Soloists*, Laelia Finneberg, Constance Willis, Parry Jones and Dennis Noble. *Double Quartette*, Mary Mansell, Ray Laurence, Helen

Andrade, Kathleen Miller-Jones, George Israel, Donald Fraser, D. Speake and S. Lifar. Mr. John Tobin will be Musical Director.

Tickets, price 5s. each (Opera Circle guest tickets) should be obtained beforehand from Mrs. Lanchester, c/o R.I.B.A., and it is hoped there will be a big demand as the arrangement of this musical evening has involved a great deal of effort on the part of the organisers and, of course, considerable expense.

THE A.A. PANTOMIME

This year the A.A. pantomime, after the didactic and Audenesque production of 1937, returned to the revue form, and though in doing so it lost continuity of interest it gained considerably in intimacy. "It's News to Me," a satirical song featuring readers of four well-known newspapers, "Sodom and Gomorrah," a jazz ballad, sung with an Old Testament vengeance, and "Lend Us Your Ears," a remarkable performance by two mimics at the microphone, were all first-rate intimate revue numbers which more than anything else in the pantomime managed to create the close contact between stage and audience which has in the past so often been missed, and which can turn a flat amateur show into an exciting experience, dispensing with private jokes about the staff and members of the Council. There were flat moments, it is true, and often a lack of purely mechanical finish that should have been remedied in rehearsal, but happily none of those embarrassingly naïf scenes that ape Noel Coward and make you wish the earth would open and swallow you up. The title of the show, "Nothing Personal," squiggled under a delightfully inconsequential drawing on the programme cover, was not taken too literally; Mr. Chamberlain and Lord Halifax, superb illusions even from the front of the house, were ridiculed with a satire that was somehow as sympathetic as it was annihilating, and made the audience accept its criticism before they knew what they were doing.

Probably the subtlest thing in the pantomime, though one imagines it would be better read than acted, was the Shakespearian "Ferdinand, Prince of Valento—or Much of a Muchness," written in a mellifluous and beautifully balanced prose rhythm that used words often meaning nothing at all without at any time destroying the sense. ("Sith it be ic an due season, and marrily hap it be I who to all else is aught . . .") Here the Rosalind theme of dressing up as a man was played off against her lover dressing up as a woman. ("For I would know my lady intimate 'ere I commit myself unto the corset bonds of marriage . . .") A duel and a wholehearted poisoning scene left an inanimate stage on which the curtain fell to the accompaniment of a flippant fanfare on a cracked trumpet. But good as it was to relish and turn over on one's tongue, it was rather remote and too much of a set-piece to get the best out of such a small theatre.



Typical recent Swedish architecture. In the Gothenburg Town Hall extension by Asplund

RECENT SWEDISH ARCHITECTURE

PART I

This article records observations made on a tour of the newest buildings in Sweden, held in the autumn of last year. Fifteen British architects took part in the tour and were the guests of Messrs. A. Johnson & Co.

Probably the two countries whose architectural work is most worth study to-day by British architects are Sweden and France. That is not to say that others have nothing worthy of consideration; there are, indeed, the Tennessee Valley Regional Planning Scheme, the astonishing town plans of Soviet Russia, the new Fascist architecture of Italy, the schools and factories of Holland and the farms of Denmark. But France seems to lead the way, as always, in the higher realms of pure design and to achieve the occasional building of outstanding brilliance, though much of the everyday building in that country is meretricious.

Sweden, on the other hand, shows a very high general level in all its building and planning work. Examples of bad design are quite difficult to find, while the best buildings avoid the striking or sensational. Swedish architecture is essentially an architecture of the people—of an informed and cultured democracy.

The reasons for this high level are worth study. First, the country is without extremes of wealth and poverty, such as are known in Britain, and class distinctions are less pronounced. The Government and political organisation are Socialist, under a constitutional Monarchy. Swedish political organisation appears to be a direct refutation of the idea, often stated to-day, that democracy has outlived its usefulness and cannot

be made to work in the high-pressure twentieth century. It is perhaps worth noting that the Prime Minister lives in a typical small house in a suburban housing estate, which was, like all such estates, designed and laid out by an architect.

The country appears also to have a firm grip of the more selfish elements of capitalism. The speculative builder is rigidly controlled both by law and quite often by his own good sense and education. Industry is not allowed to make a mess of the countryside, to which the general use of hydro-electric power contributes not a little. The wilder excesses of advertising, as in posters and electric signs, such as we know only too well in England, are noticeably absent.

In this, the country is aided by its small population—about six and a quarter millions—relative to its area, which is not quite double that of the British Isles. There have been no violent migrations of population and the comparative newness of its industrial life has so far prevented the appearance of the problem of the distressed area. On the other hand, there is a strong, well-guided, positive town-planning control in the urban areas.

Perhaps the fundamental reason for good architecture is the excellent system of public education. Not only is there good technical education available to all, but



A twelve storey block of flats at Malmo. The structure is reinforced concrete, infilled with brickwork which is colourwashed. The windows are all single sheets of glass



One of a series of dwelling houses in an orphanage. All are sited with aspect as a chief consideration. Note the simple lamp standard carrying a litter basket



Shop attached to a block of flats. Note the typical projecting eaves. The fascia is corrugated asbestos cement and the lettering cut-out metal letters painted red. The flower box is also asbestos cement



Stainless steel equipment in a hospital kitchen; this material is much more generally used than in England in all types of building. The floor is of tiles laid in stripes

design is taught in the schools as part of the education of all children. Consequently the general public is design-minded and architecture-minded. It appears that architects have not, as so often obtains in this country, to achieve good design in spite of the ignorance and poor taste of building committees and individual clients, but have to deal with persons really capable of judging design and architectural quality. The result is that far from new buildings being spoiled by poor furnishing, inappropriate gardening and unworthy accretions, the exact contrary is usually the case. Again and again the visitors saw cases where an architect's original conception had been enhanced by really skilful attention to subsidiary matters on the part of the building owners. It was also noticeable that the furniture in housing schemes, bought from shops by the tenants, was generally of good, simple design as well as of sound construction.

Moreover, the Swedes appear to be unhampered by sentimental attachment to the antique. When a building has served its purpose it is considered ripe for replacement; but every care seems to be taken that what takes its place is of equally high standard and a good product of its own age. Good living conditions for all appear to them more desirable than the preservation of outworn if beautiful buildings. This outlook was well illustrated a few years ago in the promotion of a town-planning competition for the redevelopment of an eighteenth-century area of Stockholm.

The nation's outlook on architectural matters was also revealed by work which the English visitors saw proceeding on the Parliament House. This they were told is a nineteenth-century building of good proportions but overloaded with formal and dull classic ornament. The whole building was surrounded by scaffolding, and was in process of being "shaved"—i.e., the ornament was being knocked off with pneumatic hammers. The work was naturally under the direction of an architect. The visitors reflected that the decaying detail of the British Houses of Parliament was being carefully replaced at a cost of about a million pounds.

The trades unions are strong and well organised. Wages are relatively high, but with them goes an equally high standard in craftsmanship. Plaster work and joinery work are in general superb, even in the cheapest classes of structure. The detail work of buildings, the fitting of equipment, has an almost universal neatness of finish and fixing. Sound, well-trying materials seem to be preferred to the flimsier and more showy. For instance, copper is used extensively for roofs and rainwater goods. In the newer buildings stainless steel is now a familiar material for kitchen equipment, door furniture, kicking plates, glazed metal screens and even for railings; plated metals appear to be out of favour on account of the short life of the coatings.



One of the many attractive reinforced concrete bridges connecting the islands on which Stockholm stands. Yachting is a universal pastime



Working class flats showing now typical window design, universal use of internal (heated) staircase access and low roof pitch. Roof pitches are regulated under town planning



Children's playground attached to a day nursery in a block of working class flats. The site is a wooded hill-top having magnificent views



Street furniture is always of good design. A shoeblack's stand in painted red, yellow and light blue wood. Behind is an office building by Tengbom

Structures are generally of reinforced concrete in tall buildings and brickwork in lower buildings, almost always surfaced with stucco, finished in soft agreeable colours with white predominating, but including creams, buffs, pinks, blues and pale greens. Walls are almost invariably protected with a projecting eaves, even on flat roofs. Solid parapets are rare, apparently because they are liable to cause penetration of damp from melting snow. Where roofs are used as promenades, a railing is provided, often infilled with metal sheeting or corrugated asbestos sheet, the corrugations running vertically. The same construction is used for balconies. The visitors were told that this permits melting snow on the roof surface to run out under the railings all round into external gutters. This is a small but typical example of designing for function which appears throughout Swedish work. Internal pavings, where they are not of wood, are of one of the many excellent Swedish marbles, either green or dark brown in colour.

The principal indigenous building material is soft-wood timber, though some hardwoods are used. The quality generally appears to be far higher than is used for building work in this country. Even on the cheapest housing schemes the joinery is nearly always in good straight-grained wood, free from knots, while the carpentry timber is almost of equal standard. Practically all single dwelling-houses are of wooden construction. Decorative plywoods now play an important part in interior work.

Wood is the universal material for windows. These are always of double construction, consisting of an outer glazed frame to which is fixed by finger screws and hinges an inner glazed frame. The two fit tightly together and open as a single unit. The interior glass faces require cleaning about once a month. The glazing bar has now practically disappeared in current practice, each light being fitted with single sheets of glass, drawn sheet being now popular since it gives an image almost as good as that through plate glass. There is a tendency for windows to be larger both in area per room and per unit, though exceptionally large windows are still rare. It should be realised that the use of double glazing, by greatly reducing heat losses, makes the large window not unsuited to a cold climate.

The horizontally proportioned window appears to be now the most usual. The visitors were shown a new type, centrally pivoted and consisting of a single glazing unit, of double thickness as usual. This is operated by a horizontal lever on the cill which gives exact control and opens enough for summer ventilation, though the whole unit can be swung open for inside cleaning. It was argued that the window need not be capable of standing wide open in summer, which would in any case be dangerous to children in a tall building, because the single sheet of clear glass gives a good view out. Ventilation through the cill

just above radiators and controlled by adjustable shutters now seems general practice. Extract is provided by flues leading to the roof, which it is said induce sufficient air changes without fans.

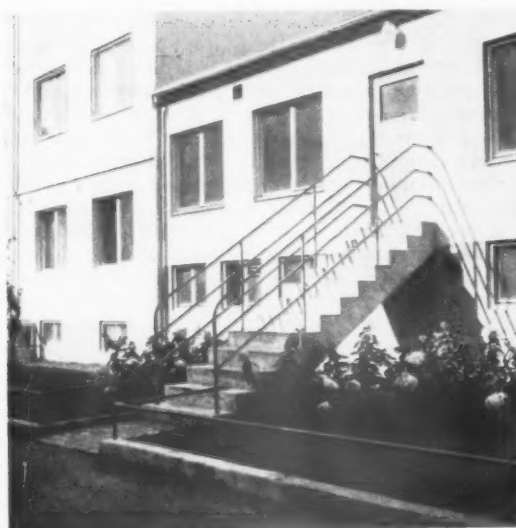
It has been remarked above that Swedish architecture is an architecture of the people. It is also inevitably an architecture for the people. The really interesting work, with a few exceptions, lies in the housing and town-planning development of the towns and its building corollaries the schools, hospitals, clinics and recreation centres. Urban development proceeds on orderly, well-planned lines everywhere; there is an almost entire absence of sporadic development. The visitors saw numerous excellent schemes of flats, sited on open land with every care for the preservation of trees and other amenities, full provision of light and air to all dwellings and of the proper quota of shops, schools, playgrounds and similar necessities. An outstanding feature of such schemes is the obvious care for the needs of children. One flat scheme had, between each one of some dozen blocks, a children's playground. Each playground contained a sand pit, paddling pool, small garden, climbing frame, swings, etc. Thus each mother could from her flat observe her offspring in an adjacent playground. In other schemes, day nurseries were provided on the ground floor of every block.

Flat schemes are mostly planned in rectangular blocks, parallel with one another; the aim is obviously to provide the rooms in every flat with their proper aspect and insolation. Rarely is there an attempt at a deliberate architectural effect from the massing and grouping of blocks, or the realisation of no more than an agreeable pattern on a plan. Some schemes are as many as twelve storeys high, served by lifts. The resulting density of dwellings to the acre is far higher than is allowed under most town-planning regulations in England. There did not, however, appear to be any of the disadvantages which are advanced in this country in opposition to tall dwelling blocks. Indeed, it was obvious that a density of sixty or more dwellings to the acre is not only feasible, but gives better conditions to the individual dwelling when planned in ten or twelve floor blocks than in five floor blocks. In other words, the tall building, properly used, appeared to give the best results in flat development. Study of actual schemes makes this point far more clear than any amount of discussion or examination of plans.

About fifteen years ago English architects became aware of the existence of a classic tradition in Sweden, which had reverted to archaic and somewhat attenuated forms. The country seems to have been fortunate in having missed the Romantic revival, or at least its worst excesses in the form of the meretricious "Tudorbethan" we know only too well in England. The Arts and Crafts movement had, however, a strong influence which, joined with something of a revival of North



Typical entrance detail of a block of flats. There is a high level in decorative gardening, flowers being massed for effects of form and colour against plain wall surfaces



An entrance to a house in a mixed scheme of houses and flats. The low kerb and railing form an alternative to a low hedge for bordering both private and public gardens



Typical recent Swedish interior design in a block of flats at Malmo, arranged as an exhibition

Most of the photographs are by Mr. Clifford Culpin [A.]. The headpiece and tailpiece to the article are by Mr. F. R. Yerbury [Hon. A.]

European architectural forms, resulted in Sweden's nearest approach to a Romantic movement. The greatest and last flowering of this movement was Ostberg's Town Hall in Stockholm. The movement never became vulgarly debased as it did in England.

Generally speaking, the classic tradition has passed straight into a full-blooded modern architecture, which derives from commonsense meeting of human requirements with logical use of structure and materials. Romanticism, except perhaps in sculpture, and to some extent in church architecture, hardly now seems to exist. Certainly the present architecture has not the faintest leanings towards the "Nordic" or any of the many revivals that have afflicted English architecture. Modern architecture seems to be fully accepted by the Swedish nation and is probably more firmly established and expressed there in all types of building than in any other country in the world. The classic tradition of which the fruits were so admired by English architects fifteen years ago (Tengbom's Concert House is an example) is now dead. At any rate its detail is wholly absent from current new architecture. Gone also is its rather bombastic showiness, its creation of façades as pieces of scenery. What has remained, its logical planning, good proportion and essential simplicity have been well incorporated in the New Architecture. The Gothenburg Exhibition of 1923 perhaps indicates the last appearance of the Old, while the Stockholm Exhibition of 1930 marks the dawn of the New.

It can be justly remarked that the foregoing statements are generalities, to all of which exceptions may be found. This is doubtless so, though such exceptions are rare. Throughout the numerous new buildings visited in Stockholm, Gothenburg and Malmo ran the clear

tone of a sane modern architecture, in which the fundamental notes were commonsense and good design.

The interest for English architects in modern Swedish work does not lie in the detail of buildings. He who goes sketch-book in hand will miss the real lesson. This lies much more in the approach to architectural problems, their study in the light of modern needs, their rational expression in available materials both old and new, their resultant planning to give light, air, comfort and amenity to all persons and, finally, in their true expression of the building needs of the people. The social system and the high educational standards are fundamentally responsible. Swedish architecture to-day is at once national in expression and international in approach.



A fountain by Carl Milles at Gothenburg



A group of small houses before their gardens have grown

Part II—Municipal Small Houses in Sweden

The following is compiled from a written statement presented to the visitors by Mr. Ake Pahlman of the Small-House Bureau of Stockholm, from a pamphlet "The Small-Housing Scheme of the City of Stockholm," by Axel H. Oxholm, published by the U.S. Department of Commerce, and from a pamphlet "Garden Cities in Stockholm," published by the Social Department of the Swedish Government. The account is of the small house work of the City of Stockholm, but systems and designs of houses in other towns appear to be very similar, and some of the illustrations are from Gothenburg.

Sweden has always contained a large proportion of individual house owners in rural districts, but until fairly recently dwellings in towns were mostly in the form of flats. Flat development is still a very important form of development even in suburban areas. New schemes of flats are to be seen surrounded by woodland. In 1927, however, following a shortage of dwellings, garden suburb schemes were started upon a remarkably original scheme of organisation known as the Stockholm System. At the end of last year about 3,000 houses had been built in Stockholm under this system.

As early as 1904 the municipality began to purchase land even outside the City boundary. As a result very large areas are now in their control, mostly purchased at quite low prices. The system of disposal to tenants is one of leasehold. The prospective owner has exclusive possession of the leased land for a period of sixty years subject to certain conditions. At the end of that time the City may extend the lease or alternatively purchase the land and the buildings on it at a fair valuation. One advantage of this system is that

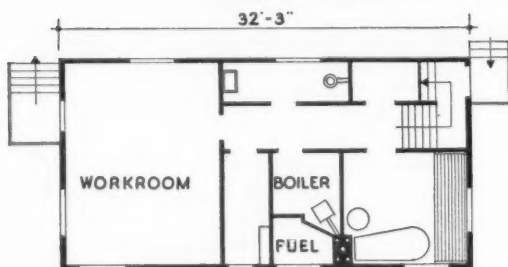
redevelopment by whole areas becomes possible from time to time should it be thought desirable. Leaseholders may transfer leases to their legal heirs in case of death, but the lease may not be sold except with the consent of the City Authority. The English system of providing subsidised houses, let at weekly rentals and maintained by the Authority is not used at all. Nor is land provided for agricultural purposes, because the houses are intended for persons employed in industry or commerce. All schemes provide parks, playgrounds, swimming pools, schools and shopping centres. Each is, in fact, a residential "neighbourhood unit," and planned as a whole.

The core of the system is that the family provides the labour for building its own house. The City Authority establishes a credit account amounting to about 90 per cent. of the estimated cost of the house. The remaining 10 per cent. is represented by the value of the labour contributed by the house owner. The City Authority redeems the building credit with a loan repayable in instalments over a period of 30 years. The annual charges range from about £47 to £52 according to the type and size of house. This includes all expenses including repayment of loan and taxes, but excludes the provision of heating, which costs the owner about £8 per annum more. Large families with small incomes are subsidised by monetary grants towards the cost of building.

The houses are built to a number of standard plans made up of standardised units. The owner may select the plan he wants. Each house consists of a semi-basement of solid wall construction on which is a



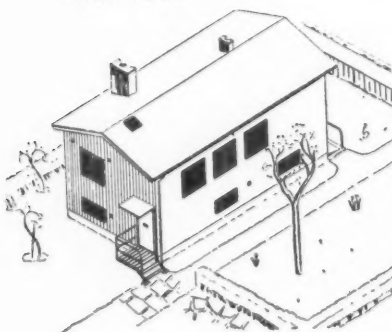
A block of houses at Gothenburg. This form of layout is rare



GROUND FLOOR



FIRST FLOOR



Plans and isometric of a typical small house described in the text. The front door is not necessarily opposite the street, the aspect of rooms being more important

superstructure, usually of one floor, but sometimes of two, of pre-fabricated timber units. The City Authority provides supervision and a certain amount of skilled labour for plumbing, central heating, electrical work, etc. As much as possible is, however, pre-fabricated, materials being cut to exact dimensions, in factories; this applies even to plumbing services, which are cut to length and threaded, ready for assembly. Standardisation of components results in a material saving in cost and eliminates much laborious hand work on the site. A family can erect a house in a maximum period of nine months.

It will be seen, therefore, that the house-owner at a charge of about one pound a week for thirty years obtains his own home, and has free possession of it for a further thirty. This charge for the first thirty years may seem high, but it must be realised that wages and other costs are relatively higher in Sweden than in England. A corresponding flat in town will cost from £80 to £95 a year, while even a one-room flat will cost as much as £50 a year. The owner is responsible for maintenance work. This is not such a serious item as might appear, since the house is of good materials to begin with and the owner is not only familiar with its construction, but having built it himself, almost always takes great pride in it and undertakes the maintenance himself. The cost of maintenance is said to average rather less than one per cent of the annual charge to the owner.

The plans all follow the same general idea. The semi-basement contains a bathroom, which is also used for laundry work, a garage or workshop, central heating furnace and coal store and a large larder for stores of food, mainly home preserves. On the ground floor are the living room, kitchen and two bedrooms in the single floor type, while in the two floor type there is an extra sitting room and two or three bedrooms over. The water closet is either in the basement or on the ground floor.

The planning is very flexible. Only the staircase and single-flue stack carry through the two floors; consequently, the basement plan can be varied, for instance, to allow a favourable fall in the ground to give access to the garage. Also, the ground floor can be turned round in a variety of ways to provide the principal rooms with the best aspects. The site plans, however, make more use of straight-line planning than in England, without indulgence in arbitrary curves or culs-de-sac. The effect is not monotonous.

The basement is constructed of pre-cast concrete blocks about six inches thick, rendered externally below ground line with a bituminous compound and rendered in cement, usually colourwashed, above. The floor of the basement is of concrete, cement rendered. The inside surfaces are plastered in the bathroom, but elsewhere colour-washed. The flue stack is constructed of pre-cast concrete blocks, each block extending over the whole area of the stack.

The superstructure makes liberal use of timber and the resultant walls have high insulating qualities. The outside facing consists of vertical timber siding, the joints being covered with flat cover fillets. Beneath is a building paper laid on $\frac{3}{4}$ inch sheathing. The latter is fixed to a light open framing infilled with wood chips from machine cutters as insulation, and inside is 2 inch tongued and grooved boarding fixed vertically. The inside surface is usually wallpaper laid on a canvas scrim glued to the woodwork.

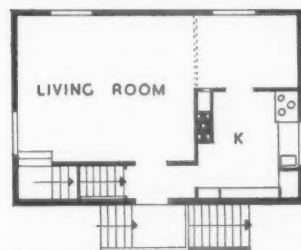
It will be seen that the English practice of making a frame of 4 by 2 or 3 by 2, and facing it on both sides, is not used. Rather the construction is a series of ledged timbers laid across one another, the central ledges being "openwork" to admit the wood chip insulation. These wall units are built up complete in the factory, including window and door openings, and only require to be hoisted into place, bolted together and connected on the outer face with vertical cover strips.

The floor over the basement is of wooden joists with boarding above and below, the space being filled with cutter chips. The roof is of flat pitch timber construction usually covered externally with bituminous ply roofing, though other materials are used. The chimney stack does not project very far and is covered entirely with a zinc flashing.

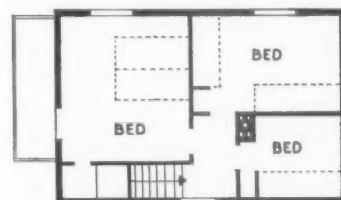
The standard of equipment is very high. All windows are of double glazing construction and of wood, the joinery work being generally excellent. Stainless steel sinks with draining boards and wall flanges, all in one piece, are now a standard fitting and are in fact supplied to about 97½ per cent. of working-class dwellings in Sweden. Cooking is by gas or electricity. Each kitchen is very carefully designed as a complete unit with cupboards, sink and cooker all fitting neatly together. Central heating also is the invariable practice. The coal or coke-fired boiler in the basement



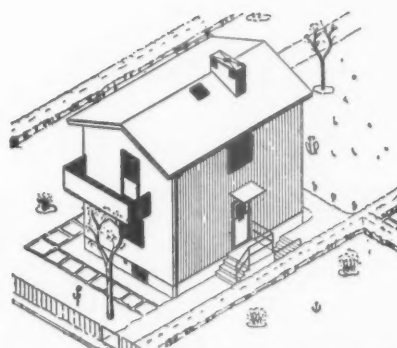
BASEMENT



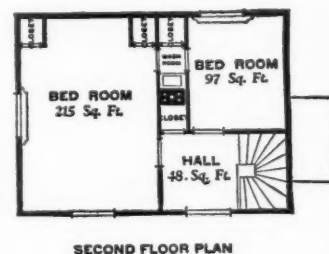
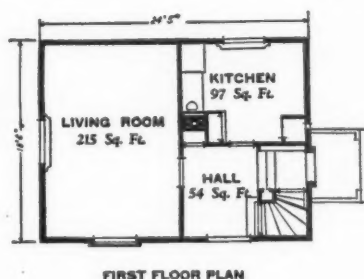
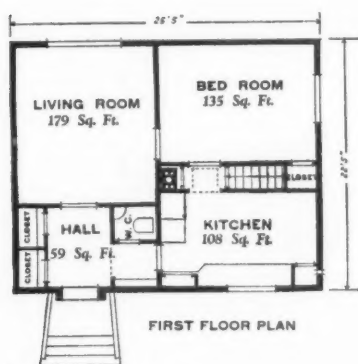
GROUND FLOOR



FIRST FLOOR



Plans and isometric of typical three-bedroomed house, from Gothenburg



A larger type of house, from Stockholm. The "garage," if used to house a car, may be approached by an excavated ramp or arranged to fit a fall in the ground

The smallest type of single house, from Stockholm. Winders are frequently used on staircases and internal W.C.s are often used but do not appear to offer serious disadvantage

heats radiators placed under the windows in all rooms. Radiators are now of welded steel, light and thin but strong, and only projecting about one or two inches from the wall face. Hot water for the bath is provided by the copper in the same room. A hot water heating system is an "optional extra."

The arrangement of the plan has several interesting features from the point of view of the housewife. There is no carriage of coal: laundry work with its resulting steamy atmosphere, is not carried out in the kitchen, which is reserved for the preparation of food: the "garage" provides abundant storage space for the perambulator, bicycles, sledges, skis and garden tools, in addition to serving as a workshop and also, if necessary, housing a small car. All the apartments are within range of the central heating plant, there being no unwarmed outbuildings: the "clean" rooms for eating, sleeping, cooking and recreation are all on one floor, raised sufficiently above ground to give reasonable privacy, but accessible by a short flight of steps from outside to the front door.

The houses are painted externally in one of a number of standard colours, all soft, light in tone and charming

to look at. The plots range in area from about 3,225 square feet to 6,500 square feet, and are separated by low ledges, so that there is a continuous garden effect. They are wide in relation to their depth and the houses are mostly, but not always, placed with their long axis at right angles to the road frontage. The widths of the plots allow abundant light and air between houses and there is often as much garden at the sides of the house as in front. This possibly gives more road frontage per house than is customary in England, but this is compensated for by making the roads very narrow and so planning estates that these narrow roads cannot be used as short cuts by cars.

Grass verges, lined with trees, are very little used, the hedges being placed against narrow footpaths. The trees which in England would occupy verges, are placed in the gardens and are pines, silver birches and similar tall slender trees. Thus the general effect is of houses placed amid greenery and approached by narrow and rather straight lanes, though the low hedges maintain an effect of spaciousness.

An analysis of the occupations of house-owners is interesting. Figures over a period of years show about



Group of houses showing how additional rooms or terraces may be added, for which the plans allow

The smallest and simplest type of house

30 per cent. to be labourers, 27 per cent. industrial and transport workers, 23 per cent. building and constructional workers, and 11 per cent. civil servants. The owners have been found to be able and very willing to remain in occupation. During the depression only two homes were compulsorily sold and immediately found purchasers. All the housing estates are situated at distances from the city centre involving a maximum tram or bus journey of 30 minutes.

The organisation of the Stockholm scheme has some obvious social merits not found in English municipal housing. The family is permanently attached to its dwelling and neighbourhood, thus helping to form a stabilised local culture. The householder has an owner's pride in his dwelling and is, moreover, thoroughly familiar with all the details of its construction. The system may not, however, be readily adaptable to English needs, because it depends on the absence of migration by industrial populations. The closing down of key industries in which the majority of house-owners were employed might easily lead to the development of a distressed area. Where, however, there is abundant and varied scope for employment or conditions are stable the scheme has much to commend it.

To architects the principal interest will lie in the

standardisation and pre-fabrication of building units and in the bulk purchase of materials. Apart from direct cost saving, the relegation of much of the work to factory processes which take place under cover, helps to spread building work over the whole cycle of the year. Some of the larger housing authorities in England have adopted a system similar to bulk purchasing in the "earmarking" of materials in bulk to cover the building programmes of the next two or three years.

The house plans and materials used, though interesting, are of less concern to English architects. The plans are conditioned by Swedish methods of living and by the climate, though in general the standard of comfort is very high. Timber as a general building material for housing is not likely to be used in England in areas where bricks are cheap and where there is a well-established brick craft. But the obvious advantages of timber in respect of pre-fabrication suggests that it might well be considered in rural housing; that is to say, for small groups or single dwellings for agricultural labourers, provided a central organisation or group of organisations are created to justify and make possible the laying down of the necessary plant.

Part III, illustrating some of the newest large buildings in Sweden, will be published in a forthcoming number.



Fig. 1



Fig. 2

River and Palace Yard fronts of William Kent's designs of 1739 for the Houses of Parliament



Fig. 3

DRAWINGS BY WILLIAM KENT FOR THE HOUSES OF PARLIAMENT, 1739

In the R.I.B.A. JOURNAL of 6 August and 10 September 1932 Mr. Fiske Kimball [*Hon. Corr. Member*] wrote a long article on William Kent's designs for the Houses of Parliament. In the course of his article Mr. Fiske Kimball, whose researches had revealed a large number of drawings relating to Kent's schemes, noticed that there were certain drawings, known to exist on the evidence of copies in the Soane Museum or from references to them in contemporary correspondence, which were missing. These missing drawings, including the originals in Kent's hand from which the Sir John Soane's copies were made, have been found in an album at one time in the possession of Sir Charles Barry, and recently presented on permanent loan to the R.I.B.A. by his great-grandson Mr. C. A. R. Barry [*A.*].

THE DRAWINGS' PEDIGREE

The history of the drawings and the manner in which they became distributed among several libraries is not easy to unravel. In 1749, as a letter among the Proceedings of the Board of Works shows, there were then at the Office of Works 48 drawings relating to the Horse Guards, the Cottonian Library and the Houses of Parliament; of these 32 related to the Houses of

Parliament. There is no further record until 1822, when Sir John Soane had certain drawings copied. There are now 46 sheets relating to the Parliament buildings in the Soane Museum, of which some twenty are copies.

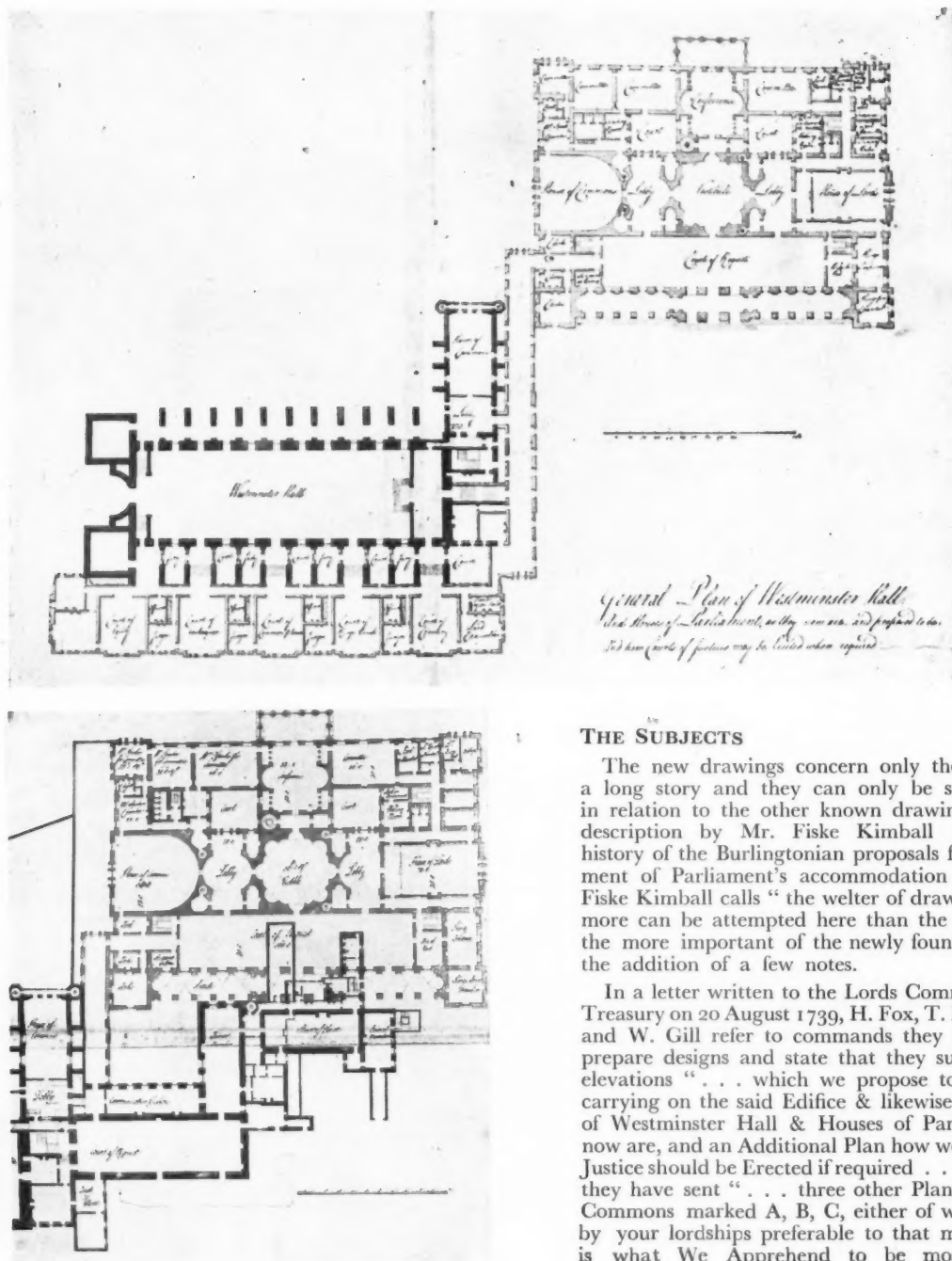
The next reference is in 1836 when Brayley and Britton* stated: "The whole of the designs are now in the possession of L. N. Cottingham."† It is not known how they passed from the Office of Works to Cottingham nor how some at least of them passed at some date between 1836 and 1847 when Cottingham died to John Gregory Grace, who gave the album at present under consideration to Charles Barry.‡

J. G. Grace was chosen, on Barry's recommendation, to execute the decorations of the new Houses of Parliament and it is possible that these drawings were given to Barry as a friendly acknowledgment of his sponsorship.

* *History of the Ancient Palace and late Houses of Parliament at Westminster.* p. 395.

† A drawing of the House of Lords and drawings of the Royal Barge were presented to the R.I.B.A. by John Dibblee Grace, J. G. Grace's son.

‡ An undated inscription in John Gregory Grace's writing is on the album's flyleaf.



THE SUBJECTS

The new drawings concern only the last phases of a long story and they can only be studied properly in relation to the other known drawings and the full description by Mr. Fiske Kimball of the lengthy history of the Burlingtonian proposals for the improvement of Parliament's accommodation and what Mr. Fiske Kimball calls "the welter of drawings." Nothing more can be attempted here than the reproduction of the more important of the newly found drawings with the addition of a few notes.

In a letter written to the Lords Commissioners of the Treasury on 20 August 1739, H. Fox, T. Ripley, W. Kent and W. Gill refer to commands they had received to prepare designs and state that they submit plans and elevations "... which we propose to be pursued in carrying on the said Edifice & likewise a General Plan of Westminster Hall & Houses of Parliament as they now are, and an Additional Plan how we think Courts of Justice should be Erected if required ..." and add that they have sent "... three other Plans for a House of Commons marked A, B, C, either of which (if thought by your lordships preferable to that marked E, which is what We Apprehend to be most commodious)

may be executed on the same ground & at the same expense as that marked E . . ." (Fig. 6 shows plan 'A'.)

Mr. Fiske Kimball noted that, when he wrote, the plans A, B, C and E were missing. All four are in the Barry Album with a fifth marked D2.

On 11 December 1739 Kent and his colleagues wrote another letter stating that alterations had been made to the plans as required and another House of Commons plan marked D was submitted which is very similar to the R.I.B.A. plan D2. The chief alteration was that the scheme as a whole was enlarged and carried further towards the Thames.

On the strength of the House of Commons plan D, the only one he had seen, Mr. Fiske Kimball identified a certain group of plans of the entire scheme as being those submitted on 11 December (F. K., Figs. 26-28) and made a more speculative identification of others (F. K., Figs. 13-17) as the plans of the earlier scheme of 20 August 1739. Of the R.I.B.A. House of Commons plans A, B, C and E are those of the 20 August scheme, as they would seem to be, the plan shape does not fit into the space designed for the Commons in the general plans Mr. Kimball has described as of 20 August, though they do conform to the pencilled-in alteration on the main storey plan (F. K., Fig. 13).

The exact chronology of these drawings is not of great importance, but a slight correction to the chronology considered probable by Mr. Fiske Kimball may be necessary with this further evidence in front of us.

The Barry Album plans of the scheme as a whole (Figs. 4 and 5) are the originals of various copies (not identical in every detail) in the Soane, two of which were reproduced by Mr. Fiske Kimball (F. K., Figs. 26, 27). These are the plans which, as noted above, he identified as belonging to the 11 December scheme.

The Barry Album also includes four elevations (Figs. 1, 2 and 3). The first of these is the original of a Soane Museum copy reproduced by Mr. Fiske Kimball

(F. K., Fig. 28), which is varied by the addition of statues not shown in the Kent original.

Two of the Barry Album elevations (Figs. 1 and 2) are obviously elevations of the River and Palace Yard fronts of the scheme shown in the Barry Album plans, but the other two, one of which is shown here as the headpiece (Fig. 3), do not fit the plans and are not as might be thought elevations of the two other sides of the building to north and south, but are probably alternative elevations of the two main façades to the River and to Palace Yard, Fig. 1 being the former and Fig. 2 with its arcade and entrance doorway beneath a pediment being the Palace Yard front.

The Barry Album also contains a transcript of the letter of 20 August.

LIST OF SHEETS IN THE ALBUM

Sheet 1. Title: *A Statement of the Expense of Building the New Houses of Parliament also an Explanation of the Various Plans with the Elevation of the intended New Houses of Parliament as Designed by Wm. Kent 1739.* (Watermark, J. Honig.)

Sheet 2. Transcript in formal hand of letter of 11 December 1739. (Watermark fleur-de-lis.)

Sheets 3-8. *The Dimensions of the present and proposed House of Commons.* Marked A [B, C, D, D2, E]. (Watermarks, fleur-de-lis (4), G.R. and crown in wreath (2).)

Sheet 9. Blank.

Sheet 10. Full opening plan basement floor of New Houses of Parliament and Law Courts attached to Westminster Hall. Scale approx. 30 ft. to 1 inch.

Sheet 11. Full opening plan main floor as 10, with title: *General Plan of Westminster Hall: and Houses of Parliament, as they now are, and proposed to be; and how Courts of Justice may be Erected when required.*

Sheet 12. Full opening plan new Houses of Parliament and existing Court of Requests and other buildings at West front. Scale approx. 18 ft. to 1 inch.

Sheet 13. Elevation. *Front to the River Thames*, scale approx. 18 feet to 1 inch.

Sheet 14. Elevation. *Front to the Old Palace Yard*, scale as 13.

Sheet 15. Elevation. Possibly alternative to 13, scale as 13.

Sheet 16. Elevation. Possibly alternative to 14, scale as 13.

Sheets 17-21. House of Commons variant plans and elevations of internal walls A, B, C, D2, E. Scale approx. 11½ feet to 1 inch.

Sheet 22. Plan showing the seating of the House of Commons in the Old Parliament building, scale 8 ft. to 1 inch.

Watermarks of all sheets from 9 to 22, one or other of the following: I. Villedary. I.H.S.+; crown, fleur-de-lis, 4.W.V.

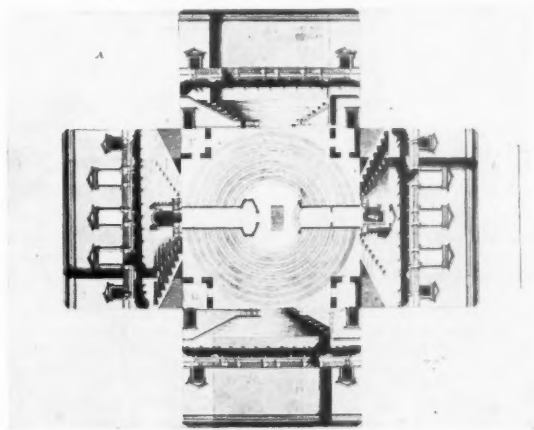


Fig. 6

PATIENTS' LIBRARIES IN HOSPITALS

"The modern hospital realises the need for mental treatment, and is equipped to use psychology, occupational therapy and books. Books offer a very simple but highly effective form of treatment, known as bibliotherapy."

"Of all the remedies applied to a sick man, reading is the only one he accepts naturally. The thought of surgery scares him, dressings are painful, and medicine bitter. The words of the chaplain recall the proximity of death. But the patient accepts this most important tool of mental therapy and absorbs its curative qualities easily and naturally. This tool is carefully selected reading matter, and it is hardly necessary to cite authorities to show the decided therapeutic value of such material."

Julian A. Sohon

Patients' libraries that are more than just a stock of magazines and occasional gift books are now generally recognised as a valuable department of any hospital service. With the general tendency of thought towards a more human atmosphere in hospitals, and the knowledge that the treatment of illness and disease must concern itself with more than its physiological aspects, an efficient library in the charge of a trained librarian should be regarded as an essential part of the equipment of any hospital organisation. Yet a great number of hospitals are unfortunately still considerably handicapped by having to make do with accommodation that not only gives little scope for the expansion of such a service, but in many cases is also quite inadequate for the simplest type of library. It is anomalous that this should be so, for the cost of the provision of an adequate room and efficient equipment for a library service that can make life pleasant for the patients is small compared with the cost of the many appliances that are used for saving it.

In general the library consists of a stack room with its necessary equipment, from which the books are distributed to the wards by means of trolleys. This is a minimum that is all too often met with makeshift accommodation; the aim should be the provision, not only of a stack room, but of a habitable reading room for those patients who are fit enough to use it. This is a council of perfection for the general hospital, but it should be regarded as indispensable in mental hospitals and sanatoria, where the relief obtained by quietness and a change of surroundings is of particular value. Such a reading room might well be used also as a

place where patients and visitors could take tea together, served from an adjacent pantry. In mental hospitals and in tubercular hospitals and wards the central supply of books should be augmented by shelves in each ward or in the open porches, for books which would possibly be changed once a week, and to which the patients would have free access, though in mental hospitals only little space need be allowed for these, since it is desirable that as many books as possible should be distributed on trolleys.

The administration of the central supply may vary with different types of hospital; there may be special libraries for infectious cases, under the control of the central administration; in hospitals for infectious diseases the distribution of books will be under the control of the nursing staff and books will be constantly burned; in large establishments with scattered pavilions—a condition often met with in mental hospitals and sanatoria—it may be necessary to have a central library containing the main stack and index, and subsidiary libraries in each main pavilion, fed from the central library. Another variation is when in a large hospital the patients' library and the medical library, though kept apart, are under the same administration, and where the hospital staff makes use of the patients' library and patients are allowed to come to it. But whatever the type of hospital, and whether it is planned on the block or pavilion system, a central stack is necessary.

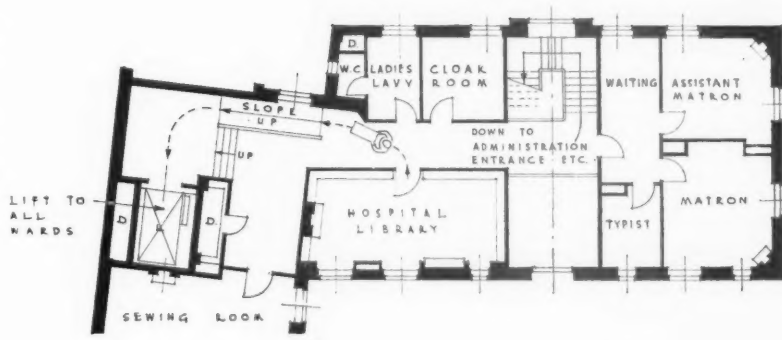
It is difficult to estimate the number of books per bed that is required. Under a Stockholm plan, inaugurated in 1932, it was considered that as many books as there

This article has been compiled at the suggestion of the British section of The International Guild of Hospital Librarians, 48 Queen's Gardens, London, W.2, and with the help of the Guild's secretary, Mrs. M. E. Roberts. From time to time we have published articles the common feature of which is the attempt made in them to clarify some subsidiary but important feature of a contemporary building type, and to do so bearing in mind particularly the neglected specialist who works in the building in question. With that intention there have been articles in recent years on concert hall platforms from the point of view of the orchestral musician, written in collaboration with the B.B.C., and on small

stages written by an actor-scene designer (R.I.B.A. JOURNAL, 23 May 1936, and 20 December 1937). The present article is in some respects rather different and by some may even be considered an example of specialist arrogance in making an "architectural problem" out of a side of hospital work the architectural implications of which, however slight, have quite clearly troubled few architects and not many hospital authorities. But the importance of an efficient library will not be denied by any intelligent person who has lain in a hospital. The demand for better and planned accommodation is growing, and the sooner architects are enabled to meet the demand with understanding the better.—Ed.

Part plan of a mezzanine floor over the administrative block in the new Westminster Hospital, showing the relationship of the library room to the lift

The library room is approximately 22 ft. by 10 ft. 6 in. and has open wall shelves with cupboards under. There are radiators under the windows, and also a gas fire and ring. A working desk stands under the central window



ARCHITECTS .

Adams, Holden & Pearson [FF.]

were beds would constitute an adequate library; in the bulletin *Hospital Library Service*, prepared in 1929 by the Hospital Libraries Committee of the American Library Association, it was suggested that three books per bed was a safe guide in a hospital of 250 beds, and that if the hospital was very small the proportion should be higher. The present minimum advocated in England by the Guild of Hospital Librarians is also three books per bed, and it seems highly desirable that in the planning of new hospital libraries this figure, and nothing lower, should be taken as a basis, for it appears to be about normal according to present standards. Special books, such as those in Braille or in foreign languages, should be additional to this figure (which is made up of the usual fiction, travel and biography class), and whenever possible space should be allowed for expansion. It should be remembered that hospitals with long-standing cases, such as mental hospitals, sanatoria and orthopaedic institutions, need space for a larger number of books than general hospitals, because a much wider selection is required.

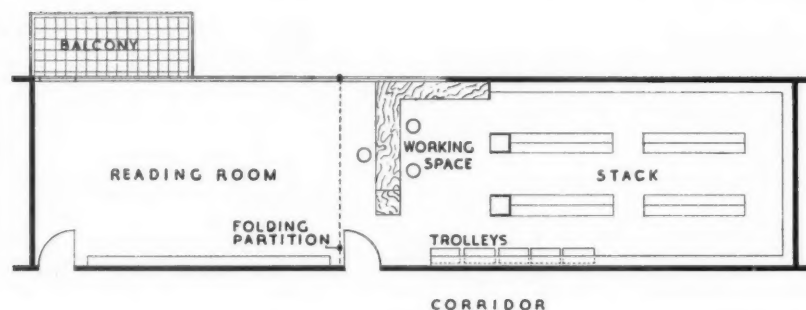
With regard to infection through the medium of books, the Society of Medical Officers of Health have undertaken research work which has shown that this is practically negligible, and it is believed that no definite case of infection from a public library book has yet been sustained. Nevertheless, the Hospital Libraries Committee of the Library Association recommend that "every reasonable precaution should be taken, and the use of book covers, which can be destroyed, might be considered." An alternative to book covers which is recommended in America, and which would appear more satisfactory, is one or two all-over coats of good shellac, which protects them and renders them

easily cleaned with a damp cloth. Books' or use in infectious wards, and for maternity and skin disease patients etc., should be carefully isolated on the shelves, and some hospital librarians consider it desirable to provide skin disease patients with paper books which may be destroyed. Actual disinfection of the books, which will be necessary from time to time, may be done either in the central hospital disinfecting room, or in a special library cupboard. At the Buchanan Hospital, St. Leonards-on-Sea, fumigation is effected in an airtight cupboard fitted with removable slatted shelves on which the books are stood on end with their covers back to back, so that the pages are widely separated, and a solution of five ounces of liquor formaldehyde and two ounces of potassium permanganate crystals in a bowl results in complete fumigation of the cupboard space, which is about 120 cubic feet in volume.

Requirements of the Library Room

The position of the library will naturally depend on the particular requirements of the hospital which it serves, but the main influencing factors are accessibility to the majority of the wards served, proximity to lifts (for trolleys), and accessibility, quietness and good orientation when it is planned in conjunction with a patients' reading room.

Although the library room may include space for a reading room for walking patients, the basic requirements of the stack and working space will probably not be materially affected; for it seems best to plan for two independent zones, allowing patients to walk about in the stack space but, whilst they are sitting and reading, relieving them of the inconvenience and distraction of having library assistants with trolleys moving amongst them, unloading and loading books to and from the shelves. Such an arrangement might



Diagrammatic plan showing a combination of stack and reading room such as is referred to in the text. The working table has cupboards under, librarians' hanging cupboards are provided at the working space end of the free standing stacks, and trolleys are parked against the corridor wall

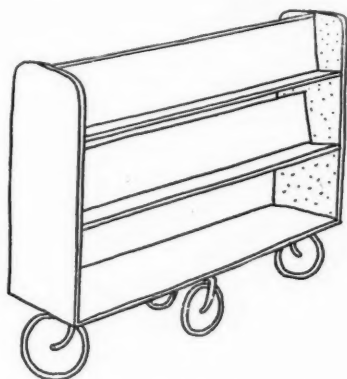
also be convenient in a newly built hospital, if the two zones were planned parallel to a corridor, in that it would permit the stack space to be provided first, and temporarily partitioned off from the adjoining zone (which could be used for other hospital purposes) until a time when money could be found for its equipment as a patients' reading room.

The planning of the stack space should allow enough room between and around the stacks for easy circulation of trolleys, space in which to park the trolleys when not in use, and working space for the library assistants, who besides loading the trolleys, distributing the books in the wards and returning books to the shelves, need facilities for cataloguing, mending and sorting. Such a working space can be efficiently and economically equipped, as it is in the Middlesex Hospital, London, by wooden counter-height tables for the card index, cataloguing and mending, etc., with shelves and cupboards under for tools, books needing mending, discards, new acquisitions, etc. Since books are dirty things to handle, a sink or lavatory basin should be provided if there is no washing accommodation near the library; and the librarian's hours being long, a gas ring for making tea is desirable. A hanging cupboard is necessary for librarians' coats, and lockers for personal belongings, if possible. If an independent fumigation cupboard for books is required, this can probably be accommodated under the working table, adjoining an external wall or extract duct, and provided with a controlled ventilating outlet.

Cost determines the choice of steel or wood shelves, and wood is generally cheaper, although a good price might be got for steel from a firm installing other metal-work in the hospital. Steel is preferable, being more

easily cleaned. Although they are not absolutely necessary in a library of this kind, adjustable shelves are more convenient. Open shelves are always preferable to shelves with any type of door—hinged doors take up a great deal of room, sliding doors always isolate some part of the shelves, and either type can be a constant source of irritation to a librarian going round from shelf to shelf making a selection for the trolley. Nevertheless, if patients or others have access to the room during the librarian's absence, it may be necessary to close and lock the shelves. Rolling shutters would appear to be ideal for this purpose, as they enable all shelves to be thrown entirely open during the librarian's hours of duty, and do not obstruct the circulation space; but wooden-framed wire-mesh doors are cheaper, and may have to be accepted as a necessary evil. If such doors are essential, and if the shelves are not adjustable, long horizontal top or bottom hung doors with stays, one shelf deep, offer the minimum obstruction between the stacks. If, however, the problem of closing the shelves arises because an adjoining reading room will be used when the librarian is off duty, it may well be found that it is no more expensive, and considerably more convenient for the librarian, to isolate the whole of the stack and working space from the reading space by means of a sliding and folding partition. This would be a simple expedient in the case of a plan such as is shown on this page.

No stacks should exceed 6 ft. 6 ins. in height, unless low cupboards which project to form a step are built at the base of the stacks. But if these cupboards project far enough to make a really safe step it is doubtful whether the floor space thus lost will compensate for the shelf space gained. Shelves or cupboards wide



A standard type of trolley, not designed particularly for hospitals

enough to take magazines must be provided; the stock carried will vary from hospital to hospital, but generally it may be said that it is not as large as is usually imagined, since plenty of magazines are always brought into the wards privately.

Book trolleys are essential for any efficient library service. The difficulty of negotiating steps, which may arise in an old or a large and scattered hospital, can be overcome by a portable wooden ramp which will go over about five steps. The number of trolleys depends upon the number of library assistants, and whether they work in shifts, but five trolleys for five hundred beds, or about four hundred readers, can be taken as a rough guide. But allowance should be made for the possibility of more trolleys than this, for it has been estimated that the adequate running of a library requires one assistant to every sixty reading beds.

The normal trolley holds about fifty books, and the principal requirements are that it should be easily wheeled, that it should have space for magazines and a tray for index cards, that as far as possible the titles of the books on it should be visible to somebody lying in bed, and that if it is double-sided its wheels should be so disposed that it can be spun round on its central axis. Many trolleys do not fulfil this last requirement, nor are they easily wheeled, since their wheels are too small and are pivoted from the four corners in the manner of a dinner waggon. The trolley illustrated above is a good version of the standard type of library trolley; it has tilted shelves and can be spun round easily, but when heavily loaded with books it is somewhat tiring to wheel it the distances that are usual in hospitals. The trolley designed for the American Library Association, and the Swedish trolley, also illustrated, though they both have defects,

are more rationally designed from the point of view of the assistant who has to push them round the wards. The Swedish type is particularly interesting. All the books can be seen at once by a patient, and the spinning round of the trolley is obviated; there are good trays for magazines, etc., and the large wheels make it light to push and easy to steer. Its possible disadvantage would seem to be that a height of five shelves is too large a range for the comfortable reading of titles by anyone lying in bed. For normal eyes three shelves is considered the maximum. Whether this is a point that matters depends, of course, upon the system of book distribution in the hospital, and whether patients choose their books from the trolley, or order them from an assistant who then delivers them on a subsequent round.



The American Library Association trolley, with a wood frame and wire wheels. Whilst it is easy to push, the space for books is not very well designed



A Swedish trolley, with a tubular steel frame, wire wheels, and wooden shelves

THE INSTITUTE'S APPEAL

DONATIONS

The following is the first list of donations and promises of increased subscriptions received up to 31 December in response to the appeal issued to all members and honorary members and students on 16 December

£	s.	d.	£	s.	d.	£	s.	d.			
Charles T. Adshead [A.]	3	3	0	W. J. Gomm [F.]	3	3	0	F. Spencer Munt [A.]	9	9	0
J. C. Anderson [L.]	9	9	0	H. S. Goodhart-Rendel [President]	250	0	0	Colin H. Murray [F.]	5	5	0
R. Angell [L.]	5	5	0	H. A. Rendal Govan [A.]	2	2	0	John Mytton [Student]	5	5	0
W. H. Ansell [F.]	25	0	0	G. Hastwell Grayson [F.]	25	0	0	L. M. Newell [L.]	2	2	0
E. W. Armstrong [F.]	5	5	0	Messrs. Mowbray Green [F.]				John A. Nightingale [Student]	10	6	
Gervase Bailey [F.]	5	5	0	and J. Herbert Hollier [L.]	5	5	0	Sir Richard A. S. Paget, Bt.			
F. Baldwin [Rt. M.S.A.]	1	0	0	John Greenidge [A.]	0	10	0	[Hon. A.]	5	0	0
Ernest Barber [L.]	3	3	0	Lt.-Col. R. F. Gutteridge [F.]	4	3	0	E. W. Parkinson [L.]	1	1	0
Leonard Barnish [F.]	20	0	0	E. E. Hall [L.]	2	2	0	Horace W. Parnacott [A.]	5	5	0
A. H. B. Beauchamp [L.]	2	2	0	E. Stanley Hall [F.]	15	15	0	J. N. Parr [L.]	3	3	0
Waller K. Beddingfield [F.]	10	0	0	N. W. Harrison [F.]	2	2	0	J. Peascod [A.]	3	3	0
James Black [Student]	1	1	0	F. W. Harvey [L.]	1	0	0	Geo. F. Pennington [Rt. F.]	2	2	0
Sir Muirhead Bone [Hon. A.]	1	1	0	J. H. Hayes [A.]	2	12	6	E. W. Harvey Piper [Hon. A.]	1	1	0
Harold Bowman [L.]	5	5	0	Stanley Heaps [L.]	10	0	0	Francis J. Potter [F.]	1	1	0
C. H. Brodie [Rt. F.]	2	2	0	P. D. Hepworth [F.]	5	0	0	G. Raymond [L.]	2	2	0
J. C. C. Bruce [F.]	1	1	0	L. Keir Hett [F.]	21	0	0	Verner O. Rees [F.]	5	0	0
A. C. Bunch [F.]	3	3	0	Henry L. G. Hill [Rt. F.]	5	0	0	Howard Robertson [F.]	15	15	0
Leslie B. Byram [A.]	5	0	0	Fredk. R. Hiorns [F.]	15	15	0	John J. Robinson [F.]	5	0	0
James D. Cairns [F.]	2	2	0	C. W. Hodgson [Student]	10	6		Douglas L. Rowles [Student]	10	6	
J. G. Callander [L.]	3	3	0	J. Hutchings [Rt. A.]	3	3	0	Vyvyan Salisbury [A.]	10	0	0
F. W. Charity [L.]	2	2	0	J. W. Jarvis [A.]	10	10	0	Ingalton Sanders [F.]	21	0	0
Miss Ethel M. Charles [A.]	9	9	0	A. H. Jones [F.]	1	0	0	Norman O. Searle [A.]	21	0	0
P. J. Clarke [L.]	25	0	0	M. W. Jones [L.]	5	5	0	R. A. C. Simpson [A.]	10	0	0
G. Flint Clarkson [A.]	2	2	0	A. W. R. Kendrick [A.]	1	1	0	J. Alan Slater [F.]	10	0	0
George Coles [F.]	5	5	0	E. G. Kington [L.]	1	1	0	R. J. L. Slater [L.]	10	10	0
A. B. Cook [Student]	1	0	0	Professor Douglas Knoop [Hon. A.]	5	0	0	W. P. D. Stebbing [L.]	10	0	0
C. M. Cooper [A.]	2	0	0	H. B. Leighton [F.]	5	0	0	Sir George Edward Stott, Bt.			
Alfred J. Cornelius [F.]	5	5	0	Rt. Hon. Viscount Leverhulme [Hon. F.]	50	0	0	J. S. Stout [L.]	2	2	0
Roderick H. Cowley [A.]	1	1	0	Alfred G. Lochhead [A.]	3	3	0	L. Sylvester Sullivan [F.]	52	10	0
The Rt. Hon. the Earl of Crawford [Hon. F.]	10	10	0	J. S. McDonald [Rt. M.S.A.]	1	0	0	J. Stuart Syme [F.]	5	0	0
Robert E. Crossland [A.]	2	2	0	P. R. McLaren [L.]	5	0	0	E. J. Tanner [F.]	10	0	0
W. T. Curtis [F.]	5	5	0	Stewart McLauchlan [F.]	5	5	0	J. Amory Teather [F.]	10	0	0
Sydney Dawe [F.]	25	0	0	Patrick McNeil [A.]	5	0	0	Albert J. Thomas [F.]	15	0	0
J. C. Dewhurst [Rt. F.]	2	2	0	F. Herbert Mansford [F.]	2	0	0	Chas. W. W. Thompson [F.]	5	5	0
John F. Dodd [L.]	1	1	0	C. Beresford Marshall [F.]	6	6	0	Harold G. Turner [F.]	1	1	0
Frank B. Dunkerley [Rt. F.]	5	5	0	Arthur C. Martin [F.]	3	3	0	William Tweedy [F.]	5	0	0
A. H. Durand [Rt. F.]	1	1	0	W. H. Martin [L.]	3	3	0	Marcus O. Type [A.]	5	0	0
Sir Lionel Earle [Hon. A.]	5	0	0	C. B. Martindale [Student]	5	0	0	Ronald Vallis [A.]	2	2	0
J. Murray Easton [F.]	15	15	0	Sir John Stirling Maxwell, Bt. [Hon. A.]	10	0	0	Edward J. Walters [F.]	2	2	0
R. Lewis Edmunds [L.]	2	10	0	Harold I. Merriman [F.]	1	1	0	B. M. Ward [F.]	2	10	0
Cyril A. Farey [A.]	3	3	0	Orlando Middleton [Rt. F.]	1	0	0	E. T. Watkin [F.]	10	10	0
R. H. C. Finch [A.]	1	1	0	C. B. K. Milnes [A.]	1	1	0	A. J. Watkins [Student]	10	6	
Roderick A. Fitton [A.]	3	3	0	Douglas W. Mitchell [A.]	5	5	0	G. F. Webb [L.]	5	5	0
D. A. Forster [L.]	3	0	0	W. F. Mitchell	5	5	0	Lord Gerald Wellesley [F.]	5	0	0
Ernest H. & H. V. Fuller [LL.]	2	2	0	P. E. Mitchell [L.]	2	2	0	G. Berkeley Wills [F.]	5	5	0
W. E. Gauld [F.]	1	1	0	J. W. S. Monson [A.]	5	0	0	Trenwith Wills [A.]	5	0	0
Thomas Gibb [L.]	2	2	0	Ernest E. Morgan [F.]	25	0	0	Percy Wilson [A.]	3	3	0
F. J. Gibbins [L.]	1	1	0	Edgar P. Morgan [L.]	3	3	0	Joseph J. Wood [A.]	1	1	0
Sigismund Goetze [Hon. A.]	100	0	0				Chas. E. Worthington [L.]	2	0	0	
(and £10.10.0 a year until further notice)							T. S. S. Worthington [A.]	5	0	0	

SUBSCRIPTIONS

The following members and students have promised to increase their annual subscriptions by the amount and for the number of years inserted in brackets against the amount

£	s.	d.		£	s.	d.		£	s.	d.	
Miss Jessica M. Albery [A.]	3	3	0 (3)	John Gedge [A.]	3	3	0 (3)	Joseph W. Murphy [Student]	10	6	0 (10)
J. P. Alcock [A.]	1	1	0 (5)	Thomas Gibb [L.]	2	2	0 (4)	W. G. Norris [L.]	2	2	0 (5)
Alfred E. Allan [A.]	1	7	0 (10)	H. B. S. Gibbs [F.]	5	5	0 (3)	Geo. F. Pennington [Rt. F.]	1	1	0 (3)
W. Godfrey Allen [F.]	5	5	0 (3)	H. Irving Graham [L.]	2	2	0 (5)	A. T. Pine [Student]	10	0	
W. H. Ansell [F.]	5	5	0 (5)	R. G. Grice [A.]	2	2	0 (3)	a year until the debt is cleared			
Col. R. B. Armistead [F.]	3	3	0 (3)	R. M. de Guérin [Student]	1	1	0 (3)	T. A. Pollard [L.]	1	1	0 (3)
Geo. P. Banyard [F.]	2	0	0 (5)	Wm. T. Harrison [Student]	1	1	0 (3)	John W. Popplewell [L.]	3	3	0 (3)
J. R. Boyd Barrett [A.]	2	2	0 (3)	A. H. Hasnip [L.]	1	1	0 (10)	John Pym [A.]	1	0	0 (5)
John C. Barton [A.]	1	10	4 (3)	K. Hart [Student]	1	1	0 (3)	J. C. Ratcliff [A.]	1	1	0 (3)
Hubert Bennett [A.]	5	0	0 (5)	J. B. Hayes [Student]	10	6	(3)	Verner O. Rees [F.]	2	2	0 (10)
T. P. Bennett [F.]	5	5	0 (5)	F. C. Haynes [L.]	1	1	0 (3)	H. T. Richardson [L.]	2	2	0 (3)
O. D. Black [F.]	1	0	0 (2)	A. G. Henderson [F.]	2	2	0 (10)	Walter M. Roberts [L.]	10	0	(4)
C. B. Bone [Rt. F.]	4	4	0	Professor W. Holford [A.]	3	3	0 (3)	H. Raymond Robinson [L.]	1	1	0 (5)
until further notice				Lt.-Col. P. M. Hope [L.]	1	1	0 (5)	Burnell H. T. Rodd [L.]	2	2	0
Chas. R. Brown [L.]	1	1	0 (3)	H. W. Horsley [F.]	1	1	0 (3)	a year until further notice			
A. C. Bunch [F.]	1	1	0 (5)	F. Howarth [L.]	2	2	0	L. A. Rolland [L.]	3	3	0 (3)
Arthur Burgess [Student]	1	1	0 (3)	a year for life				C. P. Saurin [A.]	1	1	0 (3)
H. L. Cabuche [Rt. F.]	10	6	(3)	Brig.-Gen. A. B. Hubback				Thomas E. Scott [F.]	2	2	0 (10)
P. G. J. Carter [A.]	1	1	0 (10)	[F.]	1	1	0 (5)	A. R. Scrivener [F.]	5	5	0 (3)
R. J. Carter [A.]	1	1	0 (10)	W. Dalton Ironside [A.]	2	2	0 (3)	John E. Seabright [A.]	10	6	(5)
F. L. Charlton [F.]	2	2	0 (5)	H. Jackman [L.]	3	3	0 (5)	H. T. Seward [F.]	5	5	0 (3)
T. A. Chivers [Student]	1	1	0 (3)	Rhys Jones [F.]	2	2	0 (5)	Geo. H. Shipley [L.]	3	3	0 (10)
Arthur Clayton [L.]	1	1	0 (5)	A. W. Kenyon [F.]	5	5	0 (3)	T. Sibthorp [Student]	1	1	0 (10)
Major R. A. Cooksey [F.]	1	1	0 (10)	(total amount has been paid in advance)				Alexander Smellie [L.]	2	2	0 (10)
H. C. D. Cooper [A.]	1	1	0 (3)	W. J. King [F.]	1	0	0 (10)	Edwin Smith [F.]	2	2	0 (5)
H. O. Corfiato [F.]	5	5	0 (3)	E. E. Lawrence [Student]	1	1	0 (3)	L. Sylvester Sullivan [F.]	5	5	0 (10)
John Creese [A.]	1	1	0 (5)	G. Quine Lay [A.]	1	1	0 (5)	(total amount has been paid in advance)			
W. Austin Daft [A.]	3	3	0 (3)	Julian Leathart [F.]	1	1	0 (5)	Arnold Suttell [L.]	1	1	0 (3)
B. H. Dale [Student]	2	0	0 (10)	F. G. Limmer [L.]	3	3	0 (4)	T. Ed. Thomas [L.]	1	1	0 (10)
T. S. Darbyshire [A.]	2	2	0 (3)	A. L. Linford [Student]	1	1	0 (3)	Grahame B. Tubbs [A.]	3	3	0 (3)
E. F. Davies [A.]	3	3	0 (3)	Stanley G. Livock [F.]	5	5	0 (3)	Francis X. Velarde [F.]	5	5	0 (3)
Louis de Soissons [F.]	15	15	0 (3)	(total amount has been paid in advance)				S. T. Walker [A.]	3	3	0 (3)
R. Burns Dick [F.]	5	5	0 (3)	H. M. Luyken [A.]	2	2	0 (3)	J. Ellis Wapshott [L.]	1	1	0 (3)
Wesley Dougill [A.]	3	3	0 (3)	R. Norman Mackellar [F.]	5	5	0 (3)	G. F. Webb [L.]	3	3	0 (5)
F. R. Elleray [A.]	1	1	0 (5)	H. P. G. Maule [F.]	5	5	0 (3)	W. B. Wheatley [F.]	5	5	0 (3)
Lionel H. Fewster [L.]	3	3	0 (3)	T. R. Milburn [F.]	5	5	0 (1)	A. E. M. Whitehouse [A.]	3	3	0 (3)
E. A. Fosbury [Student]	10	6	(3)	R. J. Hugh Minty [F.]	1	11	6 (5)	G. Berkeley Wills [F.]	1	1	0 (5)
Theodore Fyfe [F.]	1	1	0 (3)	A. Hugh Mottram [A.]	3	3	0 (3)	Hubert Wright [A.]	1	0	0 (5)

The donations and increased subscriptions received and promised up to 31 December 1938 represent a total of £2,247 17s. This amount does not include increase of subscriptions promised for which no definite period is stated

A.R.P.

THE INFORMAL MEETING ON 14 DECEMBER

The Informal Meeting on Wednesday, 14 December provided three of the best opening speeches that there have yet been at any of these meetings, and certainly the biggest audience, who turned up partly, it may be surmised, to see and hear Professor Haldane, the star of the evening, but also because the subject of A.R.P. is one of first interest to every member of the profession.

PROFESSOR J. B. S. HALDANE

The Chairman, Mr. K. J. Campbell [A.], opened the meeting by introducing Professor Haldane, who expressed his pleasure at coming to the R.I.B.A.

A.R.P., he suggested, was three-quarters technique and one-quarter organisation; a primary criticism of the official schemes was that they emphasised organisation and paid scant attention to technique. If A.R.P. had been seriously undertaken ten years ago, an entirely different programme would have been possible to that required to meet the present emergency. Now we had to plan A.R.P. for a reasonable possibility of war within a year.

Experience in Spain had proved that what had been done in England hitherto was mostly wrong. It had been shown that the small incendiary bombs were inefficient, and that although the larger incendiary bombs were more efficient, only comparatively few could be carried in any one raid.

Professor Haldane then gave a short and remarkably interesting description in mathematical terms of the probabilities of a man being killed. (This is described in an appendix to this report.)

Three things could be done to reduce risks:

- (a) Remove the man to a less vulnerable area.
- (b) Protect him where he is so as to reduce the probability of a bomb killing him (shelters).
- (c) Diminish the area in which there was the highest degree of probability of death (trenches).

Dispersal, he emphasised, did nothing to reduce the chance of death. One individual among a hundred men together in a room was no more, and in some respects less, likely to be killed than he would be if he and the others were scattered more widely in the vulnerable area.

What could we do? Professor Haldane questioned the efficacy of "shelter rooms" and propped-up basements. Unless we are making very substantial shelters we should aim, he suggested, at trying to reduce the area within which a bomb would kill a given person rather than at trying to protect against direct hits. Roughly speaking, it would be true to say that the value of a shelter was doubled as its area was halved.

He concluded by discussing some questions concerning underground shelters. The cost of tunnels in London clay had been shown to be £11-£15 per head, including entrances. It was not easy to see how they could be put to other uses; 7 feet was adequate for an A.R.P. tunnel; considerably more was needed for roads; as spaces were increased so was the risk of collapse. Similarly, garage-shelters needed large span roofs and were thus more easily destroyed. However, these difficulties might perhaps be overcome by special designs.

MR. R. T. F. SKINNER

Mr. R. T. F. Skinner [A.] did not claim to be an expert in such a new subject, but he had some special experience based on the A.R.P. survey of a London borough which his firm was undertaking; he also had carefully studied the few official facts.

What should architects do? Their A.R.P. functions were enormous, and extended far beyond the elementary business of designing trenches and basement shelters in buildings. A.R.P. meant the complete reconstruction of our ideas about buildings and town planning. Now was our chance to make town planning more than a joke, and to reconstruct our towns, locate industries with foresight, improve traffic arteries, and rationalise services. He described in some detail the miserable muddle of the London services; in one-third of the area of one borough no plans existed of the courses of sewers, generally gas pipes had no valves, and water supply control was inadequate if A.R.P. problems were visualised. There must be some form of centralisation and control.

The Government had done nothing to organise architects and engineers to deal with the vitally important matter of demolition and support, which was a problem of first urgency after every raid which could only be dealt with by experienced technical men.

Evacuation was not merely a business of getting people out, but of housing, feeding, teaching, doctoring them in their evacuation camps. No camps have been planned. It was the architect's job to see that the need for them was understood, and eventually to plan and build the camps, which were a far more efficient and economic form of housing an evacuated population than miscellaneous billeting. Evacuation camps also fulfilled a peace-time need as holiday camps.

But as important as anything was the construction of shelters. The work in any given locality must be co-ordinated. This was as necessary for economic reasons as much as for any others.

Too much stress had been laid on the cost of bomb-proof shelters, and the Home Office had suggested that blast and splinter-proof shelters were all we could expect. Mr. Skinner disagreed. People here, as in Spain, would insist on bomb-proof protection when the bombs came, and then they would get them. Money spent on less efficient protection would have been wasted.

Trenches had limited efficacy, but it was impossible to provide large areas of London with a proper trench system, and trenches had no peace-time use. The cost of providing blast and splinter-proof protection in existing houses was very expensive compared with the cost of trenches; whereas, he calculated, complete protection could be provided in shelters at £8 a head, a figure which compared favourably with £2 cost per head of trenches.

Mr. Skinner claimed that in certain densely populated central districts of London, where large sums of money are being spent on blast-proof protection, there was more risk of a building being damaged by a direct hit than by blast and splinter, and consequently direct hit protection was the first need.

He contested the objections that had been made to car park shelters. With proper design it was possible to make shelters that were efficient for both uses, and the cost was shared. Costs were also reduced on the schemes he proposed by making the shelters as multi-storied structures, in which the cost of the expensive protecting slab would be spread over many floors. An efficient shelter for about 7,000 people should not cost more than £8 per head, without taking into account the revenue produced by the car park.

The design of approaches, lavatories, etc., and the ventilation of tunnel shelters was more difficult and expensive than in the case of shelters of the type described. Large shelters of this type could also be placed beneath surface buildings and act as their foundations.

In conclusion Mr. Skinner suggested that the R.I.B.A. had wasted its time. Why should it be left to the A.A.S.T.A., a smaller, less influential and less wealthy body, to produce the most important report? Why had the attention of the Government not been drawn by the profession to the fact that no complete plan could be produced without complete technical data?

MR. E. L. BIRD

Mr. Eric L. Bird said that the R.I.B.A., far from having done little with regard to Structural A.R.P., had in fact taken a leading part in it. He had himself been appointed as one of the R.I.B.A. representatives on the Home Office Structural Precautions Committee three years previously. That committee was representative of the principal technical institutions. He outlined the work of the committee in advising the Home Office and described the work that the R.I.B.A.

had done and was doing. He agreed with the majority of points made by the two previous speakers but pointed out that the aim of A.R.P. was not to prevent all casualties—that was an impossible ideal—but to help towards winning a war by making air raids not worth while to the enemy. An important factor in this was maintaining a life and work of the nation, especially in the production of munitions, work which it would be the aim of an enemy to hinder. Therefore he felt that deep shelter systems in which people would be tempted to remain for many hours would cause the loss of a great volume of working time. Shelters ought to be provided immediately adjacent to places of work and dwelling so that they could be occupied easily in the very short warning time that would be available and evacuated immediately after raiding aircraft had passed.

He was also opposed to deep shelters or shelters which claimed to exclude the direct hit because he thought the official Government policy of protection against all forms of attack except the direct hit would so reduce casualties as to make air raiding hardly worth while. The majority of casualties in Spain had been caused by collapse of buildings on to basements; direct hits on shelters had been very few. Also "surface" protection was very much cheaper than "direct hit" protection, which required incredibly thick constructions to be effective. The nation could be given complete "surface" protection in six or nine months if the resources of the building industry were properly mobilised, whereas deep and elaborate shelters for the whole population would take years to construct and would cost immense sums of money.

He disagreed with Professor Haldane's statement that the kilo incendiary bomb was not a menace. In that connection he wished to emphasise that Structural A.R.P. was concerned with many other things besides the construction of shelters and one of them was the protection of buildings against the effects of incendiary bombs.

The word "bomb-proof" should not be used. There was in truth no such thing. It had been said that 20 feet of reinforced concrete would keep out the 500 lbs. semi-armour-piercing bomb. No one, however, knew what construction would keep out the effects of the heaviest high explosive delayed-action bombs, which might weigh as much as 3,000 lbs., nor whether persons beneath such protection would survive the effects of concussion. The question of protection against direct hit had been much exaggerated. The proportion of casualties caused by direct hits was very small, whereas those caused by the secondary effects of high explosive, including demolition, formed the great majority.

Experience in China had shown that the modern well-built multi-floor building was highly resistant to

the effects of high explosive. The really vulnerable areas were the rotten old cores of towns consisting of huddled buildings of poor construction. He foresaw the day when mankind would even bless the threat of air-bombing, because it would have forced them to rebuild their towns with widely spaced multi-floor framed buildings in the centres and garden suburbs on the outskirts. The Garden Cities and Town Planning Association were that evening holding a conference to discuss that very subject.

THE DISCUSSION

In the subsequent discussion a number of questions were asked and points of view expressed. One speaker suggested that insufficient attention had been paid to the design of reinforced concrete slabs. He suggested that it was possible for a wide span slab to resist a direct hit more effectively than a rigid short span slab. He also claimed that incendiary bombs were potentially a greater danger to comparatively openly developed building—small single- and two-storeyed building such as was common in England—than to close multi-storeyed building of the type usual in Spain.

Another speaker suggested that Mr. Bird had regarded A.R.P. solely as a means to win a war and not, as he felt it should be regarded, as a means of saving the civilian population's life. He also contested Mr. Bird's suggestion that deep shelters might destroy morale. They had not done so in Spain, and he felt little fear that they would do so here.

Another speaker derided the War Office's habit of building pitched roofed barracks, which he thought gave less protection against incendiary bombs than flat roofs, but another speaker suggested that the reason for this was that heavy slabs were liable to collapse as the result of explosions some distance outside the building, whereas pitched roofs were more secure except against direct hits.

Mr. Skinner's calculation that a building stood greater dangers of damage by direct hits than by blast and splinter was contested, and Mr. Bird was asked

if the chances of a direct hit had been calculated. Mr. Bird replied that the proportion of built-up to open space in the Metropolitan area was 1:6 and in the central areas only about 1:3, though naturally a good deal depended on the extent of the area examined.

In answer to another question, he said that the 20 feet thickness of a so-called bomb-proof structure generally accepted was based on research by the Ordnance Department. He wished to emphasise the alternative that protection could be provided against all but direct hits by 14-in. brick walls and a suitable roof.

Protection on this scale could be provided for the whole population in six months.

Mr. Skinner in his reply said that he thought Mr. Bird's figure of built-up area irrelevant; the calculation of damage chances by blast or direct hit applied only to central London.

There were no accurate figures showing the necessary thickness of concrete, but it was possible to derive reasonably good conclusions from analysis of craters.

Professor Haldane ended by saying that he had been impressed by the lack of precise knowledge shown by all speakers!

INFORMAL MEETINGS AND THE PRESS

At the conclusion of the meeting a motion was proposed that the meetings should be made open to reporters. The R.I.B.A. editor explained that the present system was for him to prepare a report, in consultation if necessary with the chairman of the meeting and the principal speakers. This was circulated to the architectural papers and was published in the R.I.B.A. JOURNAL. There was no idea in the Council's mind of censoring the proceedings but merely a feeling, which he knew many of those present supported, that the actual purpose of the meetings as a centre for free discussion would be damaged if every speaker felt that he had to temper his remarks to the outside world.

On the motion being put to the meeting it was lost by a large majority.

THE MATHEMATICS OF AIR RAID PROTECTION

By PROFESSOR J. B. S. HALDANE, F.R.S.

In view of the discussion which is occurring on this subject, it seems desirable to have some quantitative measure of the degree of protection afforded by a given shelter. In order to limit the problem we may consider only risks of death, and further confine ourselves to high explosive bombs. Incendiaries have proved a negligible danger to life in Spain, and gas is also negligible except for babies and those whose respirators do not fit.

Consider a given type of bomb, say, a 250 kilo. bomb, which is commonly used on central areas of Spanish cities, and a man in a given situation, whether in the street or in a shelter. Let n be the expected number of bombs falling in his neighbourhood (say, 1 square kilometre) during a war, the distribution of bombs over this area being supposed even, since aim is poor when cities are bombed. Let p be the probability that a

single bomb falling at the point (x, y) in this area will kill him. Then the probability that he will be killed in the course of the war is $P = \frac{n}{A} \int p dx dy$, integration being taken over the whole neighbourhood of area A .

The values of n and p will, of course, be different for each type of bomb, and the different expressions so obtained must be summed. Further, the man will be in different places during the war, and thus another summation is necessary. Finally, P must be summed for the whole nation.

The policy of evacuation is intended to reduce the value of n , even though it may increase that of p , as when a child is evacuated from a fairly solid house into a flimsy hut. The policy of dispersal within a dangerous area does not, of course, reduce either n or p . It merely ensures that no single bomb will kill a large number of people, while increasing the probability that any given bomb will kill at least one. It is likely to save a few lives by equalising the numbers of wounded to be treated in different hospitals; and the psychological effect of having 20 killed in each of 10 areas may perhaps be less than that of 200 killed in one area. But as it may actually increase the mean value of p by encouraging people to stay in a number of flimsy buildings rather than one strong one, it is at least as likely to increase the total casualties as to diminish them. The argument that a number of people must not be concentrated in one place in order that a single bomb should not kill hundreds is clearly fallacious when applied to a war in which the total casualties will be large. It is, however, true that a small group of key men each of whom can replace another should not be grouped together.

The effect of shelters is to diminish the mean value of p , which approaches zero in a deep tunnel, and is maximal in an open space with a hard surface which bombs will not readily penetrate. The component of p due to splinters is large in the open, but negligible in any shelter worthy of consideration, though not so in the average brick house. In general, the construction of shelters should have two aims, namely, to diminish p in the immediate neighbourhood where a bomb falls, and to diminish the area over which p has a value large enough to be taken into consideration.

With a good many types of shelter, p approaches unity within a certain area, and zero outside it. Thus in a trench with protection from falling splinters p is nearly unity if a bomb falls in the trench, and nearly zero if it does not. In these cases it is clear that P depends mainly on the area of a straight section of

trench, and is about seven times as great in a trench 70 ft. long by 6 ft. wide as in one 16 ft. long by 4 ft. wide. This fact has largely been neglected in the construction of trenches in our parks.

Again, a shelter with a roof of concrete one foot thick will give $p = 0$ for very light bombs; a fractional average value of p for medium bombs which will not penetrate the roof before explosion, but will knock down a portion of it on explosion; and $p = 1$, or nearly so, for heavy bombs with delayed action, which will penetrate the roof and burst in the shelter. It follows that the area of such shelters should be minimised, or they should be divided up by very stout walls, for example, reinforced concrete walls at least a foot thick. This is not in order to diminish the number who may be killed by a single bomb, but to diminish the area within which a bomb must fall so as to kill a given individual.

It would seem that, in the design of many shelters, too much stress has been placed on vertical protection, that is to say, protection from bombs falling immediately on the individual's protection, and not enough on horizontal protection, that is to say, protection from bombs falling at some distance from them.

I suggest that, for each type of shelter, it should be possible to arrive at a rough value of P/n per square kilometre, and that such values would be of great utility in the design of shelters, though I regard any shelters for which this value is not very close to zero as inadequate. Thus, to take definite examples, the value of P/n for a straight covered trench 5 metres by 1 metre would begin at about 9×10^{-8} for 20 kgm. bombs, supposing that such a bomb would kill everyone in the trench if it fell within 30 cm. of it. It would rise to about 4×10^{-4} for a bomb making a crater of 10 metres in diameter. The same value, for a square shelter of 100 square metres with a concrete roof 30 cm. thick but thin walls, would rise from nearly zero for a 20 kgm. bomb to about 8×10^{-4} for a heavy bomb making a 10 m. crater. These figures could, of course, be improved; and are only presented as approximations. But they suggest that in an area where heavy bombs are likely to be used the trench is to be preferred. On the other hand, were the concrete shelter divided into a number of cells by stout walls, it would be safer than the trench.

Only by such quantitative treatment can we expect to avoid mistakes in policy and design of shelters such as have occurred and are still occurring. It is, however, to be hoped that these calculations may be rendered needless by the provision of completely bomb-proof shelters such as exist in some Spanish towns.

Professor Haldane's article on The Mathematics of A.R.P. was first published in "Nature" and is reprinted with the Editor's permission

REVIEW OF CONSTRUCTION AND MATERIALS

This series is compiled from all sources contributing technical information of use to architects. These sources are principally the many research bodies, both official and industrial, individual experts and the R.I.B.A. Science and A.R.P. Committees. Every effort is made to ensure that the information given shall be as accurate and authoritative as possible. Questions are invited from readers on matters covered by this section; they should be addressed to the Technical Editor. The following are addresses and telephone numbers which are likely to be of use to those members seeking technical information. There are many other bodies dealing with specialised branches of research whose addresses can be obtained from the Technical Editor. We would remind readers that these bodies exist for the service of Architects and the Building Industry and are always pleased to answer enquiries.

The Director, The Building Research Station, Garston, Nr. Watford, Herts. Telegrams: "Research Phone Watford." Office hours 9.30 to 5.30. Saturdays 9 to 12.30.

The Director, The Forest Products Research Laboratory, Princes Risborough, Bucks. Telephone: Princes Risborough 101. Telegrams: "Timberlab Princes Risborough." Office hours, 9.15 to 5.30. Saturdays 9.15 to 12.

The Director, The British Standards Institution, 28 Victoria Street, London, S.W.1. Telephone: Victoria 3127 and 3128. Telegrams: "Standards Sowest London." Office hours, 9.30 to 5. Saturdays 9.30 to 12.30.

The Technical Manager, The Building Centre, Ltd., 158 New Bond Street, London, W.1. Telephone: Regent 2701, 2705. Office hours 10 to 6. Saturdays 10 to 1.

The Chief Technical Officer, The Building Centre (Scotland) Ltd., 425-7 Sauchiehall Street, Glasgow, C.2. Telephone: Douglas 0372-0373. Office hours, 9.30 to 6. Saturdays 9.30 to 1.

R.I.B.A., A.R.P. COMMITTEE

At their meeting on 5 December 1938 the Council established an A.R.P. Committee with the following terms of reference: "To study the problem of Structural A.R.P. in its technical relationship to architectural practice, to examine the results of British and foreign research, to supply information to members and others and to issue technical reports for publication in the Institute JOURNAL or elsewhere, subject to the approval of the Council."

The personnel of the Committee was appointed by the Council as follows: Dr. H. V. Lanchester [F.], Mr. Thos. E. Scott [F.], Mr. Oscar A. Bayne [A.], Mr. Eric L. Bird [A.], Mr. R. A. Duncan [A.], Mr. R. T. F. Skinner [A.], Mr. E. Berry Webber [A.], Mr. Herbert Ryle, C.V.O., O.B.E., F.S.I. [A.] (H.M. Office of Works), Mr. R. T. James, M.Inst.C.E., and Mr. J. W. Cooling, M.Sc., M.I.Mech.E. The Institution of Civil Engineers have been invited to appoint a representative of their A.R.P. Committee, on which the R.I.B.A. is already represented by Mr. Eric L. Bird. At the first meeting of the Committee, held on 20 December 1938, Mr. Thos. E. Scott was appointed chairman and Mr. Eric L. Bird secretary.

The appointment of this Committee to deal with the architectural aspects of Structural A.R.P. is a logical development in a process which began some three years ago when the Home Office established the Structural Precautions Committee to advise the Government on the technical aspects of this question. That Committee, which is still active, is representative of the leading technical institutions and of various Government Departments.

There followed in the spring of 1938 a request from the Home Office that the R.I.B.A. should interest and inform the architectural profession on the subject of Structural A.R.P. To this end the Home Office

made available the large volume of information prepared for and by the Home Office Structural Precautions Committee. A scheme of conferences was agreed and is now almost concluded.

The first Conference was held at the R.I.B.A. on 13, 14 and 15 June and was opened by the Home Secretary, Sir Samuel Hoare. A verbatim report was published in the R.I.B.A. JOURNAL of 27 June and has subsequently been reprinted in pamphlet form, copies of which are obtainable from the R.I.B.A., price one shilling. This report constitutes the only statement of the Government's official recommendations on Structural A.R.P. which has yet been published. Architects can, however, obtain on request, from the A.R.P. Department of the Home Office, Horseferry House, Thorney Street, S.W.1, various other documents.

Following the London Conference, similar Conferences have been arranged by R.I.B.A. Allied Societies at which the services of Mr. Thos. E. Scott and Mr. Eric L. Bird, the R.I.B.A. representatives on the Home Office Structural Precautions Committee, have been made available. Conferences have so far been held at Leeds, Birmingham, Hull, Liverpool, Norwich, Manchester, Newcastle, Reading, Southampton, Plymouth, Exeter, Belfast and Nottingham. In all cases attendances have been good, both at the inaugural public meetings and at the technical courses of instruction. In one case, that of Belfast, the attendance at the inaugural meeting numbered over 1,000. Further Conferences are to be held at Cardiff, Swansea and Glasgow in the near future.

As a result of this work it can be said that a large proportion of the profession has made a thorough preliminary study of Structural A.R.P. Many members are engaged on work of this nature on behalf of clients. In some cases local authorities have commissioned

firms of architects, or groups of firms, to undertake the necessary structural surveys and to advise on structural measures in connection with the public shelter schemes for which local authorities are responsible. It will be seen that the establishment of an A.R.P. Committee

by the R.I.B.A. Council is desirable in order to co-ordinate this work and to serve as a centre for the collection and dissemination of information. Much of this information, particularly the statement of problems, must clearly come from architects themselves.

NEW LIGHT ON DRY ROT

DRY ROT IN WOOD, 3rd Edition. By K. St. G. Cartwright and W. P. K. Findlay. H.M. Stationery Office. Price 1s.

"And the Lord spake unto Moses and unto Aaron, saying, When ye be come into the land of Canaan, which I give to you for a possession, and I put the plague of leprosy in a house of the land of your possession; and he that owneth the house shall come and tell the priest, saying, it seemeth to me there is as it were a plague in the house; then the priest shall command that they empty the house, before the priest go into it to see the plague, that all that is in the house be not made unclean; and afterward the priest shall go in to see the house; and he shall look on the plague, and, behold, if the plague be in the walls of the house with hollow strakes, greenish or reddish, which in sight are lower than the wall; then the priest shall go out of the house to the door of the house, and shut up the house seven days: and the priest shall come again the seventh day, and shall look: and behold, if the plague be spread in the walls of the house; then the priest shall command that they take away the stones in which the plague is, and they shall cast them into an unclean place without the city: and he shall cause the house to be scraped within round about, and they shall pour out the dust that they scrape off without the city into an unclean place and they shall take other stones, and put them in the place of those stones; and he shall take other mortar, and shall plaster the house."

Thus Leviticus XIV. While to-day, thanks to research and experiment, Princes Risborough is tending to usurp the consultative functions of the priesthood, it is interesting to note that, 1500 years or so B.C., there was apparently some attempt to identify the spore bearing surfaces of *merulius lacrymans*, the phrase "greenish or reddish" possibly corresponding to Messrs. Cartwright and Findlay's "yellow to red brown," though the greenish tinge of Leviticus may represent an attempt to include *coniotheca cerebella*, the fertile surfaces of which vary from yellow to olive brown. Palestinian vegetation never reaches the vivid green of these latitudes, and the olive brown of Princes Risborough may well be the same thing as the greenish of Moses and Aaron.

Cutting out and scraping was apparently not always successful, for "if the plague come again, and break out in the house, after that he hath taken away the stones, and after he hath scraped the house, and after it is plastered; then the priest shall come and look, and, behold, if the plague be spread in the house, it is a fretting leprosy in the house: it is unclean. And he shall break down the house, the stones of it, and the timber thereof, and all the mortar of the house; and he shall carry them forth out of the city into an unclean place. Moreover, he that goeth into the house all the while that it is shut up shall be unclean until the even. And he that lieth in the house shall wash his clothes; and he that eateth in the house shall wash his clothes." Here it may be noted that the possibility of human beings carrying the spores of *merulius lacrymans* was apparently understood, though this is possibly inconsistent with the recommendation that the infected stones and scrapings should only be carried "without the city into an unclean place." The "unclean place,"

however, was probably no more than the local midden or sewage farm, and, from the point of view of the prevailing winds, would presumably be to leeward of the town, so that the spores would not be likely to drift up-wind and do further damage.

Provided that the scraping and cutting out were successful the subsequent cleansing of the house seems to have been little more than the almost standardised ritual. "If the priest shall come in and look upon it, and, behold, the plague hath not spread in the house, after the house was plastered; then the priest shall pronounce the house clean, because the plague is healed. And he shall take to cleanse the house two birds, and cedar wood, and scarlet, and hyssop: and he shall kill one of the birds in an earthen vessel over running water: and he shall take the cedar wood, and the hyssop, and the scarlet, and the living bird, and dip them in the blood of the slain bird, and in the running water, and sprinkle the house seven times... and make an atonement for the house: and it shall be clean." Since none of the materials in the above schedule seem likely to act as inhibitors of dry rot it is more probable that the purification ceremony was mainly a religious one, for the same procedure is prescribed for other occasions and other diseases.

It may be noted that timber is not specifically mentioned as subject to attack, but since *merulius lacrymans* will grow through brick walls or behind plaster in search of food it is not surprising that it is often thought to attack these materials, and many text-books even now go to some length explaining that timber is the only object of attack.

The somewhat drastic method of shutting up the house for seven days is fortunately no longer necessary. This shutting up was presumably done to give the fungus a chance to grow in a stagnant atmosphere and thus determine whether it was active or not. To-day we merely take Messrs. Cartwright and Findlay's pamphlet and make up our minds with the aid of their diagnostic table and the accompanying photographs. If we are still flummoxed it is always possible to send a sample of the infected wood to Princes Risborough for diagnosis. Thus Leviticus may be of interest to the antiquary, but the contemporary authorities are for the practising architect. While Leviticus stops short after prescribing the appropriate treatment, Cartwright and Findlay continue with a section on the precautions to be taken if outbreaks of dry rot are to be prevented in new buildings. This section has been contributed by the staff of the Building Research Station and deals very faithfully with the construction of walls and floors. Many architects will be familiar with some of the suggestions given, since the same problems have often been dealt with in the Station's now familiar *Questions and Answers*. None the less it is much better to have the whole story in a convenient and easily accessible form. Watford and Princes Risborough are admittedly sub-divisions of the one controlling Department of Scientific and Industrial Research, but they exchange information and correlate their results in a way which might well be emulated by other Government bodies.

PHILIP SCHOLBERG

Book Reviews

MUSEUMS AND ART GALLERIES: A FIELD FOR PROGRESSIVE ARCHITECTURE. THE CARNEGIE REPORT

Reviewed by SIR CYRIL FOX, Director of the National Museum of Wales

Ten years ago the Carnegie United Kingdom Trustees published a report on the museums of the British Isles prepared for them by Sir Henry Miers. This report disclosed serious deficiencies in every aspect of the museum service in the provinces of this country, and was widely discussed. It presaged an attempt on the part of the trustees to help the museums to improve themselves, as they had already done with astonishing success in the parallel case of the libraries. The greater complexity of the museum problem, however, demanded a cautious approach, and during the intervening ten years a variety of methods have been tried by the trustees.

The professional Association (the Museums Association, which is imperial as well as national) has been supported and its organisation developed; and grants have been made (a) to provincial museums, (b) to encourage the extension of the museum service to rural areas, (c) to improve the training and qualification of curators. In all some £24,000 has been spent or promised on these policies, and the time seemed ripe for a reassessment of the situation. The qualifications of the expert chosen for this reassessment, Mr. S. F. Markham, are exceptional. He assisted Sir Henry Miers in preparing the original report; he has, on behalf of the trustees, visited Dominions and Colonies, and prepared directories of their museums and art galleries; and he has personally visited and studied most of the hundreds of museums in this country.

All aspects of the museum problems are adequately considered in twenty chapters of the new report, full of sound observation and (sometimes acid) comment, and written in a straightforward and readable style.

Regarding museum service, educationally speaking, as important as library service, Mr. Markham notes with surprise that over a score of towns with a population of over 40,000 have no museum; and he refers to the "one-room affair that can be found not only in a hundred small towns, but often in towns large enough to know better." In the matter of finance we are, then, not surprised to learn that about 480 museums have an income of less than £300 a year; that many are staffed by persons of the caretaker class; and that some salaried museum officials in the employ of local authorities get less than the town dustmen.

A Report on the Museums and Art Galleries of the British Isles (other than the National Museums) to the Carnegie United Kingdom Trustees: by S. F. Markham, M.A., B.Litt., M.P. Obtainable free on application to the Trustees, Dunfermline.

Mr. Markham deplores the widespread practice, very marked during the last ten years, of regarding old buildings as suitable for museums. Though his knowledge of the history of building in this country is shaky—he remarks "if we take the year 1500 as marking the general introduction of the half-timbered house"—his outlook is sound. A museum performs a variety of functions, which can be summarised as conservation and exhibition of material, and the making of it available for research; none of these functions, he says, can be adequately fulfilled in a structure built as a dwelling-house. The reviewer, in the course of a discussion at the last Museums Association meeting in Belfast, went so far as to urge that architectural experience in modern factory construction rather than of civic building should be applied to the design of the museums of the future.

The chapter on "Visual Education—Display" is illustrated with photographs which contrast the (still surviving) nineteenth-century methods of exhibition with modern—very modern—methods. The old is undeniably bad; but the pendulum has swung too far; the display (in the Frontispiece) is too attenuated. And the reviewer sees little hope for the future in an asymmetrical cubistic treatment of stands for case exhibits: rational labelling in the examples illustrated seems hardly possible!

In the last ten years, in Mr. Markham's opinion, whilst the larger and many of the medium provincial institutions have gone ahead, smaller museums have deteriorated, "and it may be said that at the moment there are nearly 250 museums (one in three) which require drastic reorganisation, or, alternatively, complete transference of the collections to more efficient institutions."

Another tendency is for new museums to be established: this, if the author's view of the deterioration of existing museums is sound, is a surprising fact. Mr. Markham asserts that the rate is approximately one every three weeks. "The majority of these," he remarks, "like many of their predecessors, have no permanent financial provision, and as soon as the initial fervour has passed they will probably sink into the state in which so many other museums started by enthusiasts now find themselves."

But Mr. Markham's survey is not one of unrelieved gloom. He is of opinion that the work of the Carnegie Trust has produced important results, such as better financial support for many of the leading museums; a

higher standard of curatorship; greater influence of the professional organisation; the growth in the strength and usefulness of the regional federations, which have been a feature in the development of the last ten years; and a great advance of public interest in museum work. The seriousness of the situation, however, may be gauged by the fact that among the changes on the "credit side," to which Mr. Markham draws attention, is "the tendency for the poorly financed museum to die a natural death. It would, of course, be better if this could be accelerated."

Mr. Markham's recommendations are far-reaching. After detailing a series of proposals he reflects that even these will be inadequate, and that only a root and branch reform will bring health into the movement. "Either," he says, "there should be a new Ministry which would number among its duties that of developing local cultural services, or, alternatively, the museums and art collections of the country might be placed directly under the existing Board of Education. In any case, there is only one body in the country strong enough, wealthy enough, and having at its call sufficient expert guidance, to bring better direction to the movement, and that is the Government."

He urges the appointment of a Royal Commission to consider the whole question of the future of provincial

museums in this country; and hints at Government inspection of provincial museums as an almost necessary outcome. Nevertheless, the work of the Carnegie United Kingdom Trustees, and the Museums Association, must and should go on, but both should be clear about the immediate aim of their policies. Mr. Markham demands that in every town of over 30,000 inhabitants a "Museum and Art Gallery designed by the best architects of our time should be built; this development must proceed side by side with a great improvement by some means of the existing intellectual level and cultural outlook of municipal museum committees."

These excerpts will prepare the reader for the last sentence in the report: "The museum movement of this country is, in spite of its grey hairs, only in its infancy. Just as we look with a mixture of amusement and horror on the type of museums that contented our grandfathers, so in turn will our grandsons and granddaughters be surprised and shocked at what we regard in our own day as being quite efficient centres of visual enlightenment."

The excerpts will also prepare the public interested in museums for a storm. Mr. Markham has already been in several of his own making, and enjoys the experience.

ESTATE DEVELOPMENT

DEVELOPMENT OF PRIVATE BUILDING ESTATES. By F. Howkins. 2nd ed. 8vo. 356 pp. London: Estates Gazette, 1938. 16s. 6d.

An architect who is responsible for the development of a modern residential estate needs to be equipped with something more than the ability to prepare a capable layout and to design good houses. He must, if he is to serve his client adequately, be familiar with many points of statute and common law, and furthermore, must understand the financial basis of estate development.

In order to obtain this knowledge much valuable time might be wasted were it not for the existence of Mr. Howkins' book, of which a second and completely revised edition has just been published. It is one of the most practical technical works available. It deals with essentials in a clear and logical manner, and sufficient information is given to provide a working knowledge of the subject without becoming too involved in legal or technical matters.

The new edition gives an accurate, condensed account of the important Acts of Parliament brought into force since the first edition was published—the Land Registration Act, 1925, the Town and Country Planning Act, 1932, the Housing Act, 1936, the Public Health Act, 1936, and the Restriction of Ribbon Development Act, 1935. It is satisfying to note that reliable guidance is given on local authorities' usual interpretations of Section 2 of the last of these—an interpretation that appears to make the title of the Act a misnomer.

The chapters treating of estate layout and the design of roads and sewers are not always so reliable as those devoted to law and finance. On pages 141 to 143 layout plans are illustrated which cannot be called good since the curves of the roads lack beauty, and little attempt has been made to arrange for pleasant grouping of the houses. Again, the

design of an estate road shown in section on page 177 is not satisfactory; the grass verge, being only two feet wide, is too narrow to look well and to be maintained in good condition.

On page 164 an illustration shows the combined system of drainage, and in the explanatory note it is stated that a 6 in. drain will take "up to ten houses." This is a very conservative statement; the figure given may be more than doubled with safety. The suggestion made in the text that the practice of connecting each house separately to sewers in the road is "the best" is open to doubt. This method adds considerably to the cost of development where separate S.W. and F.W. sewers are required.

Throughout the book the author has viewed his subject from the standpoint of the estate speculator. He makes no apology for this, and in the final chapter indicates some of the benefits which have been enjoyed through the efforts of private enterprise. It is, however, unfortunate that in the section devoted to site planning the table giving dimensions of building plots should place on record the suggestion that small detached houses require a brickwork frontage of only twenty-two feet. Anyone can design a house for this frontage, but it is the constant repetition of narrow-fronted dwellings, in detached and semi-detached form, which makes so many of the modern speculative builders' estates ridiculous.

Management, disposal of sites, and finance are treated most capably in the later chapters. One small error only has been noted: in the table on page 263 the £ sign in "£5,500 feet" should be deleted.

In conclusion, it may be stated with confidence that this book is almost indispensable to the architect who is laying out his first estate, and is a valuable work of reference for those who are constantly engaged in this type of practice. C. B. P.

NINETEENTH CENTURY TOWN PLANS IN JUGO-SLAVIA

URBANIZAM U SRBIJI, OSNOVNA ISPITIVANJA I DOKUMENTACIJA (TOWN PLANNING IN SERBIA, DOCUMENTARY STUDY). By Branko Maksimovic. 4to., 144 pp. Belgrade. 1938. n.p.

There are few Western Europe town planners who have studied the very interesting development of town planning in the Balkans. This short thesis by Dr. Branko Maksimovic, prepared under the auspices of the University of Ljubljana, is perhaps the only publication on the subject that has come to England.

The text is in Jugo-Slavian, but has added a short and seemingly good French synopsis. There are 95 illustrations; some in the first part are general historical illustrations of examples from Western Europe, but most of the remainder are plans and aerial photographs of remarkably interesting towns in Jugo-Slavia.

After the collapse of the mediæval Serbian State in the fifteenth century the whole country fell into a state of ruin, and was even further devastated by the wars of liberation at the start of the nineteenth century. The attainment of political freedom from foreign domination coincided with a renaissance of Serbian culture which was shown not least in the re-establishment of town planning values.

At first the large immigrations into the free Serbia complicated the problem and resulted in large anti-social appropriations of land, but laws controlling the amount of land allowed in the possession of one proprietor were made, and in time the need for the creation of towns according to an established plan became appreciated. Old towns now freed from their Turkish populations were abandoned and replaced by new towns which met the needs of the new culture and social life. Dr. Branko Maksimovic describes the social and formal qualities of the new towns, many of which are illustrated. Each had its details modified to suit local conditions. Underlying the planning practice was the theory that all the inhabitants were equal, a principle that required all building plots to be equal in size, and which led automatically to the use of grid plans. Many interesting variants of the grid plan can be studied in the pictures.

It is suggested that Serbian towns can be considered as one of the last manifestations of the town planning ideas of the classical renaissance, yet behind that is a direct line to the urban culture of antiquity.

This is an interesting book which makes a definite contribution to the material before the Western planning student.

SMALL DUTCH HOUSES

KLEINE LANDHUIZEN IN HOLLAND. By F. Hausbrand. 4to. 92 pp. Amsterdam: "Kosmos." 1938. F.4.90.

Holland has long had a high reputation for thoughtful architecture, and this book gives a representative selection of small cottages and houses, mainly in the country, but occasionally in the suburbs. It is the house of the wide site—not the narrow one. The steep pantile roof is perhaps the most common covering, for the Dutch make them so efficiently, but there are many flat roofs, and a few thatched. The plans are neat and straightforward; some of the simple constructions ingenious and useful. Occasionally the useful article of the past figures incongruously in the ultra modern of steel furniture and plate glass—as the stove on page 27; and the

bird's-eye view of the staircase on page 21 shows one of those amazing successions of winders that would tax the ingenuity of an English joiner, but seems second nature to the Hollander.

The Dutch words of the plans need not alarm the English reader. Eetkamer, Keuken, and Spreekkamer have only to be said aloud to be recognised, while the less familiar Fietsen can be interpreted by the many lines of cycle tracks, and the knowledge of the innumerable cycles that make progress easy in this flat country. The buildings are sensibly grouped in alphabetical classes according to price, and the plans are drawn to the same scale, 1-250.

H. C. HUGHES [F.]

A TEXT-BOOK FOR ENGINEERS

MECHANICS OF MATERIALS. By P. G. Lawson and W. J. Cox. 8vo. x+408 pp. London: Chapman & Hall; New York: Wiley, 1938. 18s. 6d.

This new book by the authors of an earlier book well known to English engineers and architects, *Properties and Mechanics of Materials*, is written primarily for engineering students, for whom the first fifteen chapters, it is stated, may be regarded as a minimum course. The remaining eight chapters are more advanced and specialised than is required to satisfy students' needs. The examples are very largely concerned with structural engineering. Mr. Lawson is Associate Professor of Engineering Mechanics at Yale; Mr. Cox was recently Assistant Professor in the same faculty, and is now Commissioner of Highways for the State of Connecticut.

STEELWORK TABLES AND DATA

Messrs. Dawsons, Ltd., have published a revised edition of their handbook of steelwork data. The stresses calculated are those usually adopted in Great Britain in accordance with the B.S. Specification and the revised L.C.C. Byelaws which came into force from 1 January 1938.

THE BIRMINGHAM CIVIC SOCIETY

REPORT OF THE BIRMINGHAM CIVIC SOCIETY, 1937-38.

The chief matter of architectural interest in the recently published report of the Birmingham Civic Society is a proposal which has now been accepted by the City Council to set aside a sum of £1,000 each year for the beautification of the city. This is another instance of Birmingham's ability, largely through the influence of its Civic Society, to make and adopt original and constructive policies. Other matters dealt with are the railings of St. Philip's Churchyard, lamp standards and the guide to Beoley Church.

A CHEAP EDITION OF SIR HERBERT BAKER'S BOOK ON RHODES

Cecil Rhodes. By his architect, Herbert Baker. 8vo. xviii+172 pp.+13 plates. Oxford U.P. 1938. 5s.

This is a cheap reprint in the "Oxford Bookshelf" series of Sir Herbert Baker's life of Rhodes. When Mr. John Begg reviewed the first edition in these pages he said: "The book... enables one to have, at last, something of a convincing picture of the paradoxical giant, the big-hearted, practical idealist, the shy imperial dreamer and self-effacing egoist..."; and "the story of an architect's relations with his unique client... will be read by architects with delight...".

Review of Periodicals

Attempt is made in this review to refer to the more important articles in all the journals received by the Library. None of the journals mentioned are in the Loan Library, but the Librarian will be pleased to give information about price and where each journal can be obtained. Members can have photostat copies of particular articles made at their own cost on application to the Librarian.

Normally the journals referred to in this review, all of which are in the R.I.B.A. reference library, cannot be borrowed. Members are, however, asked to encourage their local public libraries and their local society's library to take as many journals as they can afford; and they are asked, for the convenience of local members, to notify the R.I.B.A. of what journals are known to exist in public or private hands in their own neighbourhood.

SCHOOLS

R.I.B.A. JOURNAL 1938. 5 December. P. 137.
Girls' Modern School, Bedford, by O. P. Milne [F.]. Accommodating at present 350 girls, extension up to 500 is contemplated.

THE ARCHITECTURAL FORUM (NEW YORK). 1938. December. P. 418.
Institute of Science Building, Cranbrook Academy, Michigan, by E. Saarinen, comprising museum, library, lecture hall, classrooms, laboratories and offices.

EXHIBITIONS

THE ARCHITECTURAL FORUM (NEW YORK). 1938. December. P. 468.
The A.I.A. exhibition of architecture in the San Francisco Museum of Art, designed by E. Born.

MEMORIALS

JOURNAL OF THE ROYAL ARCHITECTURAL INSTITUTE OF CANADA (TORONTO). 1938. December. P. 259.
Article on British war memorials by E. R. Arthur, and on foreign war memorials by P. Brieger.

HOTELS AND RESTAURANTS

DESIGN AND CONSTRUCTION. 1938. December. P. 478.
Reference section on Hotels and Inns, with a concise section giving data on materials, equipment, finishings, furnishings and fittings, etc.

TÉR ÉS FORMA (BUDAPEST). 1938. No. 11. P. 315.
Country hotel with approximately forty bedrooms, by Miskolczy and Csonka.

MODERNE BAUFORMEN (STUTTGART). 1938. December. P. 677.
Quick-service restaurant for 250 people, by R. Kotas.

OFFICES

THE ARCHITECTURAL FORUM (NEW YORK). 1938. December. P. 425.
Detroit Edison Company service building, comprising offices, repair shops, drafting room, and sales and demonstration rooms.

INDUSTRIAL

ARKKITEHTI (HELSINGFORS). 1938. No. 10.
Good number devoted to a large sulphate pulp mill at Sunila, on the Gulf of Finland, by Alvar Aalto; built by several industrial firms jointly. The mill is on an island, connected to the mainland and the employees houses by bridges. Groups of houses for the workmen, foremen, engineers accommodate 82 families, and additional houses are under construction to bring the number up to 160. There is a detached house for the manager. Light and heating are supplied from private central stations. The mill buildings are of reinforced concrete frame.

MODERNE BAUFORMEN (STUTTGART). 1938. December. P. 661.
Cog-wheel factory at Friedrichshafen, by W. Ritter.

TRANSPORT

JOURNAL OF THE INSTITUTION OF MUNICIPAL AND COUNTY ENGINEERS. 1938. 20 December. P. 721.
New central omnibus station at Leeds, by D. Currie. The scheme when completed will comprise a departure station and an arrival station. Illustrations show the completed arrival station, which is for the time being serving a dual purpose.

SPORTS BUILDINGS

ARCHITEKT S.I.A. (PRAGUE). 1938. No. 9-10. P. 153.
Summer camp for gymnastics, by Balcerák and Kopp. Comprising a central building for meals and administration, a number of small chalets for sleeping, and a swimming pool, running track, boathouse, etc. The buildings are of timber, and accommodate about 120 people.

CINEMAS

HEATING AND VENTILATING ENGINEER. 1938. December. P. 266.
Article on air-conditioning in cinemas, by L. W. J. Henton.

RELIGIOUS

BOUWKUNDIG WEEKBLAD ARCHITECTURA (AMSTERDAM). 1938. 17 December.
DE 8 EN OPBOUW (AMSTERDAM). 1938. No. 25.
Interesting Synagogue in Amsterdam, by A. Elzas. Frame construction, and good use of material internally.

HOUSES

R.I.B.A. JOURNAL. 1938. 19 December. P. 180.
Reinforced concrete house at Frognal, Hampstead, by Connell, Ward & Lucas [A.A. and L.], with an article by the client.

WOOD. 1938. December. P. 565.

Small timber house in Westmorland, by B. Le Mare [A.].

FLATS

DESIGN AND CONSTRUCTION. 1938. December. P. 467.

Part II of "Impressions of Sweden," by F. E. Towndrow, dealing with Malmö and the large Ribershus scheme of middle-class flats.

BYGGMÄSTAREN (STOCKHOLM). 1938. No. 33.

Number on the Ribershus scheme of middle-class flats at Malmö, by N. E. Eriksson, D. Helldin, R. Welin and H. Granholm. Situated in a parkland area, the scheme covers about half a square mile. The blocks are three or four storeys and nine or ten storeys in height, and the standard of finish, equipment and accommodation very high for the relatively low rentals. Good use has been made of double-height living rooms.

CASABELLA (MILAN). 1938. No. 131. PP. 18, 24.

Two blocks of flats at Rotterdam. A ten-storey reinforced concrete frame block, with balcony access, by Van Tijen and Maaskant, and a seven-storey steel-framed block with more liberal accommodation and internal lift and staircase access, by Van Tijen and Van der Broek.

CASABELLA (MILAN). 1938. No. 131. P. 12.

Eleven-storey blocks of flats on the water front at Genoa, by L. C. Daneri. When completed, the scheme is to comprise eight of these blocks, linked by shops, restaurants and other communal facilities.

CASABELLA (MILAN). 1938. No. 131. P. 4.

Good photographs of the work of the Hungarian architect Fred Forbat, illustrating principally his blocks of flats in Berlin, and several small houses.

MATERIALS

R.I.B.A. JOURNAL. 1938. 19 December. P. 186.

Notes on spring-bronze weatherstrip for doors and windows, designed to prevent heat losses through cracks.

WOOD. 1938. December. P. 586.

Article on the fire resistance of timber, by E. Pope, dealing with simple precautionary measures.

WOOD. 1938. December. P. 588.

Comprehensive data sheet of wood-fibre wallboards, giving sizes, composition, weights, prices, uses, methods of fixing, and figures for sound absorption and thermal conductivity.

CONSTRUCTION

ANNALES DE L'INSTITUT TECHNIQUE (PARIS). 1938. September-October. P. 35.

Papers on the waterproofing of roof terraces, by Debès and Varlan. Good diagrams (pp. 43-45), showing examples of gutters, copings, rainwater disposal, etc.

HISTORICAL

APKNTKCTYPA (MOSCOW). 1938. No. 10. P. 4.

Work in Moscow by Kazakov (1738-1813).

TOWN AND COUNTRY PLANNING

THE TOWN PLANNING REVIEW. 1938. December. P. 107. Part IV of "Park Planning," by R. H. Mattocks, dealing with areas primarily intended for active recreation. Valuable tables are given indicating sizes of apparatus for kindergarten playgrounds, space allowances round playing fields, and dimensions of pitches for organised games.

THE TOWN PLANNING REVIEW. 1938. December. P. 79. Article on Rural Zoning in the U.S.A., by L. S. Greene.

JOURNAL OF THE TOWN PLANNING INSTITUTE. 1938. December. P. 39.

Article on town planning in relation to defence, by Sir Alexander Rouse, Chief Technical Adviser to the A.R.P. Department of the Home Office.

L'INGEGNERE (MILAN). 1938. No. 11. P. 743.

Projects for the development of the Cathedral piazza at Milan.

GENERAL

R.I.B.A. JOURNAL. 1938. 5 December. P. 113.

Paper on "Economics of the Building Industry—Achievements and Anomalies," by Oliver W. Roskill.

R.I.B.A. JOURNAL. 1938. 19 December. P. 165.

Paper on "The Next Twenty Years," by Professor W. G. Holford [A.].

R.I.B.A. JOURNAL. 1938. 5 December. P. 133.

Article by Percy V. Burnett [F.] on "The Design of Window Openings for Efficiency of Illumination."

THE ARCHITECTURAL FORUM (NEW YORK). 1938. December. P. 449.

Section illustrating the best of the present work in and around Miami, Florida. Examples include shops, offices, hotels, clubs and dwellings.

THE ARCHITECTURAL FORUM (NEW YORK). 1938. December.

No. 1 of "Plus," a supplement devoted to modern architecture which aims to "add opinion, exploration and new controversy to reporting." N. Gabo writes on "Towards a Unity of the Constructive Arts," and Dr. S. Giedion on "Can Expositions Survive?" Several buildings are rather sketchily illustrated under the title of "Habitation"—a folding mobile house by A. Clauss, a wood cabin by H. Elte, a timberho use by W. Muschenheim, the Gooland Hotel, Hilversum, by J. Duiker, and a Paris apartment house by J. Ginsberg and F. Heep.

N.A.S.A. JOURNAL. 1938. December.

This is the third number of the second volume. Run by the Northern Architectural Students' Association, it is a good and sensible production, indicative of the growing movement amongst students towards a real sense of the responsibility of the profession. The emphasis of this number is on A.R.P.; "A.R.P. Commentary," by J. Price Nunn, "Town and Country Planning and National Defence" by F. Leslie Halliday, and "Architects, A.R.P., and the Structural Engineer" by D. P. Burke. E. Maxwell Fry contributes an article on the development of the MARS group, and B. A. Le Mare on design in timber. The editorial paragraphs—"Have the right vision and the right action will follow"—imply a great deal between the lines. The format and layout are a departure from previous issues, and a great improvement, but it is curious that in a paper run by an association of all the northern schools, there is nowhere any mention of education.

Accessions to the Library

1938-1939-V

Lists of all books, pamphlets, drawings and photographs presented to or purchased by the Library are published periodically. It is suggested that members who wish to be in close touch with the development of the Library should make a point of retaining these lists of reference.

Any notes which appear in the lists are published without prejudice to a further and more detailed criticism.

Books presented by publishers for review marked

Books purchased marked

* *Books of which there is at least one copy in the Loan Library*

ARCHITECTURE

Year Books:—

ARCHITECTURAL ASSOCIATION

Diary & year book.

1939. R.

THEORY

POND (IRVING K.)

72.01 : 7.01

A Strange fellow and other club papers. [To Chicago Literary Club.]

7¼". viii+212 pp. N.Y. & Chicago. priv. prin. 1938.

Presented by the Author, ARCH. D. (HON.), P.P.A.I.A. [Hon. Corr. Mem.].

HISTORY

[ARCHITECTURAL PRESS, publ.]

72.03 (41/42)

A Short chronological history of British architecture.—Ein kurze chronologische geschichte etc., cover title. (No title-page.)

fo. n.p. [19—]

Presented by Mr. H. T. B. Spencer [A.].

72.03 (42.1) : 902.6

COMMITTEE FOR THE SURVEY OF THE MEMORIALS OF GREATER LONDON AND LONDON COUNTY COUNCIL.

*Survey of London:

Volume xix. Old St. Pancras and Kentish Town (the parish of St. P.—, part ii).

11¾". Lond.: L.C.C. 1938.

R. & copy presented by Mr. J. E. Yerbury [F.].

72.03 (429) : 902.6

ROYAL COMMISSION ON . . . HISTORICAL MONUMENTS IN WALES AND MONMOUTHSHIRE

An Inventory, &c.:

Anglesey.

10¼". Lond.: H.M.S.O. 1937. £1 17s. 6d. R.

BALANOS (NICOLAS) 72.032.8 (38 A) : 711.421.3] 69.051.3
Les Monuments de l'Acropole [Athens]. Relèvement et conservation.

pfo. 13" : text, 120 pp. + folding diags. ; 147 pls. Paris : Massin et Lévy. [1938.]

No. 15 of an edition of 25.

Presented by the Author, Conservator of the Monuments of the Acropolis.

GELL (Sir WILLIAM)

72.032.75

* Pompeiana : the topography, edifices and ornaments of Pompeii, the result of excavations since 1819.

2 vols. la. 8o. Lond. 1835.

Presented by Mr. J. E. Yerbury [F.]. To Loan Library.

HUBERT (JEAN)

72.033.42 (44)

L'Art pré-roman [primitive Romanesque]. (Les Monuments datés de la France series.)

11¼". vii+203 pp.+xl pls. Paris : Ed. d'Art et d'Histoire. 1938. (12s. 6d.) P.

ARTHUR (E. R.)

72.034 (71) (42)

The Early buildings of Ontario.

12" x 9¼". 24 pp. Toronto : U.P. ; Oxford : U.P. 1938. 2s. 6d. R.

DRAWING

[TAYLOR (HENRY)]—AN ARCHITECT, pseud.

S.R. 72.064

Notes on sketching tours. By an A.—

la. 8o. Lond. & Manch. [1880.]

728.84 (42.72)

Another copy, bound. With MS. additions. Incorporating HEATHCOTE (C. H.), The old halls in the neighbourhood of Manchester, from R.I.B.A. [Trans. xxiii] 1872-73.

SALWEY (JASPER)

72.064 : 741.023.32

How to draw in pen and ink.

la. 8o. Lond. 1931.

—Both presented by Mr. William Eaton [F.].

EVETTS (L. C.)

72.064 : 744.9

Roman lettering . . . with . . . the history of lettering in Britain.

9¼". vii+87 pp.+pls. Lond. : Pitman.

1938. 7s. 6d. P.

PROFESSIONAL PRACTICE

MINISTRY OF HEALTH

72.08 : 34

Building byelaws. (Circular 1756.)

leaflet. 9¾". Lond. 1938. R.

72.088.5 (714) (083)

PROVINCE OF QUEBEC ASSOCIATION OF ARCHITECTS (ASSOCIATION DES ARCHITECTES &c.)

Architects' register.—Registre &c.

pam. 11¼". Montreal. 1938. R.

BUILDING TYPES

(CIVIL)

BRITTON (JOHN) and PUGIN (AUGUSTUS)

S.R. 725 (42.1)

Illustrations of the public buildings of London : with historical and descriptive accounts etc.

2 vols. large paper, 8o. as 4o. Lond. 1825-28.

Presented by Mr. F. H. H. Vowles.

ITALY : MINISTERO DEI LAVORI PUBBLICI

725.1 (43.68)

Le Opere pubbliche nella Venezia Giulia. 1918-1938. [Compiled by Ugo Sartori and Carlo Tigoli.]

2nd ed. 13¼". v+145 pp. Rome. [1938.]

Presented by the Italian Embassy's Press Department.

SHEPPARD (EDGAR)

725.171 (42.1) SJ

Memorials of St James's Palace.

2 vols. 8o. Lond. 1894.

Presented by Mr. H. T. B. Spencer [A.].

TREMLETT (LUCIEN)

725.39 (439B)

L'Aérogare de Budapest. (From Nouvelle Revue de Hongrie, Dec.)

pam. 10¼". Budapest : Société de la "N— R— de H—".

1938. R.

SCHWEIZER (O. E.)

725.89 + 725.74

Sportbauten und bader. (Sammlung Götschen series.)

6¼". 135 pp. Berlin & Leipzig : Gruyter. 1938. R.

(RELIGIOUS)

JAMES (J. H.)

726.6 (429 LI)

*A History and survey of the cathedral church . . . Llandaff.

4o. Cardiff. 1898.

Presented by Mr. William Eaton [F.]. To Loan Library.

(EDUCATIONAL)

- TERRASSE (CHARLES) 727.3 : 377.4 (64)
 Médersas [theological colleges] du Maroc. (Documents
 d'architecture series.)
 pfo. 10 $\frac{1}{4}$ " x 8 $\frac{1}{4}$ ". 35 pp. + 70 pls. Paris: Morancé.
 [1927.] (14s. 6d.) P.
 MARKHAM (S. F.) 727.6/7 (41/42)+069 (41/42)
 * A Report on the museums and art galleries of the British Isles
 (other than the national museums). (Carnegie United Kingdom
 Trustees.)
 11". (iii) + 179 pp. + xxiv pls. Edin. 1938. R (2).

(DOMESTIC)

- BOULTON (E. H. B.)
 * Timber houses.
 1937. Another copy. To Loan Library.
 Presented by the Exhibition Sub-Committee.
 STUDIO, publ. 728.03 (492)
 Special numbers:
 * 1913. Old houses in Holland. Text and illus. by S. R. Jones,
 etc. Chas. Holme, ed.
 1913.
 Presented by Mr. William Eaton [F.]. To Loan Library.

- NATIONAL HOUSING AND TOWN PLANNING COUNCIL
 Summary of the proceedings of the . . . conference . . . 1938.
 pam. 1938. R.
 EWART (JOHN) 728.6
 A Treatise on the arrangement and construction of agricultural
 buildings.
 fo. Lond. 1851.

- PAPWORTH (JOHN BUONAROTTI) E.W. 728.68
 Rural residences, consisting of a series of designs for cottages, etc.
 [1st ed.] 1a. 80. London. 1818.
 —Both presented by Mr. F. H. H. Vowles.
 ILLINGWORTH (J. L.) 728.81 (42.74.)
 Yorkshire's ruined castles.
 7 $\frac{1}{2}$ ". xvi + 184 pp. + xlii pls. Lond.:
 E. J. Burrow. [1938.] 6s. 6d. P.

- TAYLOR (HENRY) 728.84 (42.71/72)
 * Old halls in Lancashire and Cheshire, Etc.
 fo. Manchester. 1884.
 Presented by Mr. William Eaton [F.]. To Loan Library.

- HAUSBRAND (F.), editor 728.86 (492)
 Kleine landhuizen in Holland.—Small country-houses. [Title
 and introd. in 4 languages.]
 11". var. pp. + 91 pls. (backed). Amsterdam: Kosmos.
 [1938.] (f. 4.90.) R.

DETAILS

- HARTEL (AUG.), editor S.R. 729.3.033.4/5 (43)
 Architektonische details des mittelalters.
 pfo. fo. Berlin. [18—.]
 Imperfect.
 Presented by Mr. F. H. H. Vowles.

- [COOMARASWAMY (A. K.)] 729.342
 Symbolism of the dome. (From the Indian Historical Quarterly,
 xiv, No. 1.)
 9 $\frac{1}{2}$ ". 56 pp. Calcutta. 1938.
 Presented by the Author.

ALLIED ARTS AND ARCHÆOLOGY

- STALEY (EDGCUMBE) 7.02 (45 F) : 338.6
 * The Guilds of Florence.
 2nd ed. 1a. 80. Lond. 1906.
 Presented by Mr. H. T. B. Spencer [A.]. To Loan Library.
 1st ed., same date, in Reference Library.

- LOUKOMSKI (G. K.) 7.032.66
 Art Etrusque. Etude &c.
 11 $\frac{1}{4}$ ". 60 pp. + 80 pls. (backed). Paris: Duchartre.
 [193—.] (8s.) P. (remndd.).

- COULTON (G. G.) 7.033.4/5 : 3
 Medieval panorama. The English scene from Conquest to
 Reformation.
 8 $\frac{1}{4}$ ". xiv + 801 pp. + viii pls. Camb.: U.P. 1938.
 15s. P.

- COTCHETT (LUCRETIA E.) 749.03
 * The Evolution of furniture.
 10". x + 118 pp. + front. + xciv pls. Lond.:
 Batsford. 1938. 12s. 6d. R. & P.

- ATHENS: BRITISH SCHOOL AT ATHENS
 The Annual. Index to Nos. xvii—xxxii.
 [1938.] 10s. R.

- PALESTINE: DEPARTMENT OF ANTIQUITIES
 The Quarterly. Vol. viii, Nos. 1 and 2.
 Jerusalem: O.U.P. 1938. R.

BUILDING SCIENCE

- MITCHELL (C. F. and G. A.) 69
 * Building construction.
 13th ed. Part i: Elementary course.
 7 $\frac{1}{2}$ ". Lond.: Batsford. [1938.] 6s. 6d. R. & P.

- WARLAND (E. G.) 69
 * Building construction for national certificate.
 Vol. i (first year course).
 8 $\frac{1}{2}$ ". Lond.: Engl. Univ. Press. 1938. 5s. R. & P.

STRUCTURAL ELEMENTS

- REDPATH, BROWN & Co.
 * Tables of working stresses for the design of steel columns &c.
 1938. R. (second copy). To Loan Library.

- BUILDING INDUSTRIES NATIONAL COUNCIL: ADVISORY
 COMMITTEE ON BUILDING ACTS AND BYELAWS
 Code of practice for the laying of magnesite composition flooring
 and dadoes.
 pam. 9 $\frac{1}{2}$ ". Lond. 1938. 1s. 3d. R.

STRUCTURAL MECHANICS

- LENINGRADS INSTITUTA INZHENEROV PROMISHLENNOGO
 STROITELSTVA (INSTITUT D'INGÉNIEURS POUR BÂTIMENTS
 INDUSTRIELS À LENINGRAD)
 Trudi (Annales). Livr. 6.
 8 $\frac{1}{2}$ ". Moscow. 1938. R.

PRACTICE AND INDUSTRY

- KNOOP (DOUGLAS) and JONES (G. P.) 69.08 : 331.81 72.03 (42)
 Overtime in the age of Henry VIII. (From Economic History
 (Supplement), Feb.)
 pam. 9 $\frac{1}{2}$ ". n.p. 1938.
 Presented by the Authors.

MATERIALS

- LAURSON (P. G.) and COX (W. J.)
 * Mechanics of materials.
 1938. R. To Loan Library.

- KNOOP (DOUGLAS) and JONES (G. P.) 691.2 : 622.35 72.033.4/5 (42)
 The English mediæval quarry. (From The Economic History
 Review, Nov.)
 pam. 10". n.p. 1938.
 Presented by the Authors.

- DEPARTMENT OF SCIENTIFIC AND INDUSTRIAL RESEARCH:
 BUILDING RESEARCH
 * Bulletins: No. 13. Calcium sulphate plasters.
 1938. R. (second copy). To Loan Library.

ZINC DEVELOPMENT ASSOCIATION

- * Zinc : its manufacture and uses. (Publication No. 1.)
[1938.] R. (second copy). *To Loan Library.*
691.75 : 69.024.5

Zinc : roll cap roofing. (Publication No. 2.)
7½". 39 pp. Lond. 1938. R.

COPPER DEVELOPMENT ASSOCIATION

- Aluminium bronze. (Publication No. 31.)
8¾". 151 pp. Lond. [1938.] R.

CONSTRUCTION

- NICHOLSON (PETER) S.R. 693.1
A Popular and practical treatise on masonry and stone-cutting :
&c.
2nd ed. la. 80. Lond. 1831. (12s. 6d.) P.

DEPARTMENT OF SCIENTIFIC AND INDUSTRIAL RESEARCH :
BUILDING RESEARCH

- Bulletins :
693.625
No. 16. External rendered finishes. A survey of continental
practice. F. L. Brady and L. F. Denaro.
pam. 9¾". Lond. : H.M.S.O. 1938. 1s. R.

SANITARY SCIENCE AND EQUIPMENT, PROOFING

- TEMPLE (H. E.)
* Invisible embedded panel warming system for hospitals. &c.
pam. [1938.] R. (second copy). *To Loan Library.*

- BURDICK (C. L.) 697.932 : 551.57
The Humidity of the air.
pam. 8½". Lond. : Spon. 1938. 1s. R.

JORDAN (L. A.) and GAY (P. J.)

- * Priming joinery timber.
pam. 1938. R. (second copy). *To Loan Library.*

- HUNTER (L.)
* Domestic pests. &c.
1938. 7s. 6d. P. *To Loan Library.*

TOPOGRAPHY

- SCOTT-MONCRIEFF (GEORGE), editor 91 (41.1)
The Stones of Scotland. [By G. S.—M—, W. D. Simpson
and others.]

8¾". xii + 132 pp. + pls. Lond. : Batsford. 1938.
10s. 6d. R.

MACGEORGE (ANDREW)

- * Old Glasgow : the place and the people. *Etc.*
3rd ed. sm. 40. Glasgow. 1888. *To Loan Library.*
[1st ed.], 1880, in Reference Library.

- CLINCH (GEORGE) 91 (42.12 B + SG)
Bloomsbury and St. Giles's : past and present ; *etc.*
40. Lond. 1890.

—Both presented by Mr. H. T. B. Spencer [A.].

- DRUETT (W. W.) 91 (42.19 S + HW)
The Stanmores and Harrow Weald through the ages.
8". xv + 263 + var. pp. + pls. Uxbridge. 1938.
7s. 6d. P.

- PRITCHETT (H. D.) 91 (42.74 W)
John de Wycliffe. The hamlet of Wycliffe, family and birthplace
of the reformer. (From Darlington and Stockton Times.)
Revised ed. pam. 8". [Darlington.] 1933.
Presented by the Author [former F.].

- STARK (FREYA) 91 (53)
Seen in the Hadhramaut.
9¾". xxiii + 199 pp., incl. pls. + (i) map. Lond. :
Murray. 1938. £1 1s. P.

- MINISTRY OF AGRICULTURE AND FISHERIES : DEPARTMENTAL
COMMITTEE ON THE ORDNANCE SURVEY 912 (061) (42)
Final report.
11". Lond. : H.M.S.O. 1938. 5s. R.

SHIPMAN PRESENTATION

(SUPPLEMENTARY ENTRY)

- STUKELEY (WILLIAM) E.W. 72.031 : 571.945 (42.21 A)
Abury, a temple of the British Druids, &c.
fo. London. 1743.
Bound after Stonehenge, a temple &c., 1740.

GENERAL KNOWLEDGE PAPER ANSWERS

Although plenty of evidence came to us that the General Knowledge paper both entertained and instructed (the evidence came largely as malicious attempts to see if the compilers of the paper knew the answers to it) very few took it seriously enough to write their answers down and send them to the R.I.B.A. to qualify for the prizes. Only one set of answers of quality anywhere near prize status was received and that from Mr. Dudley Harbron [F.], who gets his catalogue. Here are the answers :—

ALL ABOUT ARCHITECTURE

1. Geoffrey Scott. *Architecture of Humanism*, p. 41.
2. Sir Reginald Blomfield. *Studies in Architecture*, intro.
3. Howard Robertson. *Architectural Composition*, p. 5.
4. Goethe. *Conversations with Eckermann*, 23 March 1829.
5. Sir J. G. Jackson. *Architecture a Profession or an Art*.
6. Lethaby. *Life of Philip Webb*, p. 122.
7. Goodhart-Rendel. *Vitruvian Nights*, p. 8.

PRESIDENTS

1. Tite.
2. Horace Jones.
3. T. L. Donaldson.
4. Beresford-Hope.
5. one set, Alfred and Paul Waterhouse.
6. Goodhart-Rendel and Raymond Unwin.
7. George Aitchison for Lord Leighton.

ARCHITECTS

1. One.
2. Reputed to be original of the "Jerry" in "Jerry builder"; was architect-builder of houses in Argyll Road, Kensington, and elsewhere in London.
3. It was his name.
4. Wren, Hooke, Chambers, R. Adam, Stuart, Rennie, Penrose.
5. Wyatt, Aston Webb, Lutyens.
6. Mulciber. (*Paradise Lost* Bk. 1, 740.)
7. (a) James Wyatt. (b) A. W. N. Pugin. (c) Inwood. (d) H. L. Elmes. (e) Basevi.

8. I'Anson, by Charles Garnier to whom he had presented the Royal Gold Medal.

9. WYATT family. Jeffrey, Benjamin, James, Thomas [Henry], Matthew [Digby], Lewis, Philip.

SCOTT family. Elizabeth, Geoffrey (interloper; author of *Architecture of Humanism*), George [Gilbert], Giles, Oldrid, Adrian (interlopers Gillree and Darracott, who was General H. Y. D. Scott, designer of Albert Hall).

SAYINGS

1. Bacon. *Essay on Building*.
2. Emerson. *The Problem*.
3. Sir Balthazar Gerbier. *Discourse of Building*, Ch. 14.
4. Ruskin. *True and Beautiful; Sculpture*.
5. Samuel Johnson. *The Idler*, p. 62.
6. Dr. Evans on Vanbrugh not by Pope on the authority of Vanbrugh's latest biographer.
7. Wistan Auden.
8. E. C. Bentley (we apologise for quoting this incorrectly).
9. Vanbrugh on the Duchess of Marlborough.
10. Christopher Wren in *Parentalia*.

BUILDINGS AND BUILDING

1. (a) St. John, Red Lion Square, by J. L. Pearson; (b) Scotch Church, Regent Street, by Tite; (c) St. Dunstan in the West, by Shaw. (The question was meant to imply three churches, not one.)
2. St. Paul's Cathedral, pavement to apex of cross.
3. Great Pyramid
4. (a) Balk—collar beam, half cheeked both ends; Oxter—vertical strut from ceiling joist to rafter; Harling—rough casting; Clouring—The rubbing down of the facing of stonework for resurfacing purposes and as done by stone restoration firms; Slappings—Break through and form opening; Jams—Ingoings as to windows and doors; Dooks—Wooden plugs as built into walls for the fixing of strips behind lath and linings; Sarking—Roof boarding of a pitched roof, usually 8 in. by $\frac{5}{8}$ in. stuff; (b) Sparkling—Rough plastering applied from within to the under surface of thatch or tiling, between the rafters; Dadle and bottomfy—Ladle out the slush with a scoop and trim the bottom to a true shape; Suent—The lines will flow with better continuity or less irregularity; Plymmed up—Brought to a level; Lime-ash Floor—Gypsum plaster spread on a layer of reeds crossing the joists at right angles and also plastered beneath between the exposed joists.
5. Liggers (Norfolk) Broches (Norfolk)
Ssprays (Berks) Spar (Dorset)
Tenple Rods (Northumberland) Spear (Devon and Cornwall)
Sparrow (Surrey)
Spelks (Cumberland) Spric (Berks)
Springles (W. Midlands) Spikes (Glos, Dorset, Wilts)
Radlings (Sussex) Tangs (Pembroke)
Scolps (Scots)
Pricks (Northants)
Buckles (Derby)
Speets (Lincs)
Prods or Stobs (Yorks)

and many more.

SCIENCE

1. The original window was square diamond-shaped, 4 ft. along each diameter, the blind hung square and just covered the points of the diamond. The new window was made 4 ft. square and set square in wall.

2. The pressure of the town mains would not be increased at all, even if the capacity of the tank were 30 million gallons, so long as the vertical head of water in the mains, measured from the top surface of the water in the tank, was no more than 50 ft. The hydrostatic pressure of water is dependent solely on the vertical head of water and not on the size of the tank, reservoir, or the size of any of the pipes. The weight (300,000 lbs.) of the 30,000 gallons of water is supported by the bottom of the tank, and that is supported by the tower, which in turn is supported by the soil under the foundations.

3. It would if water were flowing from some cock in the house; but very shortly after all flow was stopped, the pressure in the house would be the same as that in the water main.

4. The weight of the barge is exactly equal to the weight of the water which it displaces, so that given that there is plenty of canal on either side of the bridge the presence of the barge over the bridge makes no difference to the weight supported by the bridge.

5. Suppose the diameter of the circular disc was 24 in. Then using the centre of the disc as centre, describe a circle 12 in. in diameter and make a circular cut along this line with a key-hole saw. After this, with an ordinary saw, cut straight across the two portions along a diameter. Finally make another such straight cut along the diameter at right angles to the first straight cut. There will then be four quadrant pieces, the straight edges of which are 6 ins. long, and four quarter pieces of a ring 6 ins. wide. Place two of these together, so as to leave the lenticular hole between them. This being done, it will be found that two of the quadrant pieces will just fill in the gaps at the ends where the two ring pieces touch.

[The four last questions were from Scientific Paradoxes and Problems, and were reproduced by permission of the author, Mr. A. S. E. Ackermann.]

A SIMPLE STORY

- | | | |
|----------------|---------------|----------------|
| (1) Wood | (14) Hook | (27) Maule |
| (2) Soutar | (15) Pike | (28) Braddell |
| (3) Gray | (16) Eagar | (29) Adams |
| (4) Blow | (17) Barefoot | (30) Hamp |
| (5) Wheeler | (18) Webb | (31) Lidbetter |
| (6) Hill | (19) Holford | (32) Ansell |
| (7) Whitehouse | (20) Daft | (33) Goodhart- |
| (8) Roberts | (21) Wornum | Rendel |
| (9) Hall | (22) Powers | (34) Allberry |
| (10) Gardner | (23) Holden | (35) McLean |
| (11) Bunch | (24) Johnson | (36) Cooke |
| (12) Brooks | (25) Howitt | (37) Reilly |
| (13) Fisher | (26) Needham | (38) Heaps |

FACES

1, Telford. 2, Robert Adam. 3, Lethaby. 4, Street. 5, Victor Laloux. 6, Butterfield. 7, Otto Wagner. 8, Norman Shaw. 9, Pugin. 10, Nesfield. 11, Bodley. 12, Peter Behrens. 13, Adolf Loos. 14, Berlage.

Correspondence

THE ARCHITECTS' BENEVOLENT SOCIETY APPEAL

*Architects' Benevolent Society,
66 Portland Place,
London, W.1
3.1.39*

To the Editor, JOURNAL R.I.B.A.

DEAR SIR,—Now that the year has closed I think you may be glad to know the total results to date of the appeal on behalf of the Architects' Benevolent Society, made in the leading architectural journals through the kindness of the respective editors.

In response to these appeals a total amount of £443 8s. 4d. has been received by the Society, of which £241 15s. represents subscriptions and £191 13s. 4d. donations.

May I again express to you our most sincere and grateful thanks for your kind and generous co-operation in our endeavour to increase the income of the Architects' Benevolent Society to an amount adequate to its needs.

We should also like to take this opportunity of conveying our thanks to all those who have so kindly responded to the appeal.

Yours faithfully,
B. N. SOLLY,
Secretary

"A.B.S. 4D. A HEAD"

*3 Elverton Street,
Vincent Square,
London, S.W.1
16.12.38*

To the Editor, JOURNAL R.I.B.A.

DEAR SIR,—When I read the President's appeal in November last I thought of writing to ask him what architects did in 1914-18, and again in 1931-33, to justify his statement that "they did magnificently." It would be interesting to know exactly what they did as a profession (apart from a few individuals who did much, as citizens, without thought of being architects) compared with other professions.

The A.B.S. was founded in 1850, and from that date a few have done all in their power to support the Society; but never at any time has the profession, as a whole, complied with the lowest conception of decency in helping those who have fallen by the way.

In 1914-18 a few did much; many did not do anything; and the others looked after No. 1. The young men fought and died, the middle aged talked much and did little, and the old could not give help, nor obtain help.

What the profession did magnificently in 1931-33 God and the President know; but I don't think the A.B.S. did more than receive a little extra from those already helping.

No, Sir, it is no use appealing to the magnificent generosity of architects. The only question is, can they be shamed into doing a duty which to them will seem like daylight robbery?

If the architectural Press does not succeed, it is to be hoped that the daily Press will quote from your columns, until the profession, as a whole, realises that each member of the community has a responsibility which reaches out beyond self, and that there is a further special responsibility attached to membership of any professional body.

Actors and artists recognise this, but the architects of my generation never have, and the only hope for the A.B.S. is that the younger generation may realise the fact that charity should not stay at home, and the greater the sacrifice the more worthy the part that is played in giving to those in greater need.

As the appeal for St. George's Hospital Fund pointed out some time ago—"All you can hold in your cold, dead hand is what you have given away."

Yours, etc.,

ONE WHO GIVES HIS MITE TO THE A.B.S.

In answer to the questions asked in the first paragraph of this letter the Secretary of the A.B.S. writes as follows:—

In 1914-18 the Architects' War Committee collected from the profession funds which were disbursed in grants and loans, and subsidies for work done under a scheme of Civic Surveys. £19,430 was distributed in this way during the War years.

During the economic crisis of 1931-35 over £13,000 was subscribed to the Architects' Unemployment Relief Fund. £11,000 having been collected during the first two years. In collaboration with the London Society, London Survey Committee, Architectural Graphic Records Committee, and the Slum Clearance Committee of the R.I.B.A., work was found for over 100 men during this period of distress.

The present appeal, based not on a special crisis but on the steady miseries of every day, has so far produced just over £400. There is still time to raise this total to an amount nearer to the hopes of the A.B.S.

B. N. S.

THE BUILDING INDUSTRY

46 Catherine Place,
Buckingham Gate,
London, S.W.1
29.12.38

To the Editor, JOURNAL R.I.B.A.

DEAR SIR,—As Mr. Hicks' letter in your issue of 19 December, p. 202, protests, I have done him an injustice and should like to make him an apology. I feel none the less that the concluding paragraph of his letter might have been less strongly worded had he realised (a) that I had to make the written contribution in amplification of my verbal replies without having seen the transcript of the discussion, and (b) that the remarks which I wrongly attributed to him were in fact made by Mr. Coppock, the secretary of the Federation of which he is president. I did, moreover, write "I think it was Mr. Hicks who suggested . . ." and my main concern was to reply to the point raised.

I need hardly add that I had no intention of attributing it to the wrong speaker. With so many arrows in the air my confusion of the notes of the different bow strings was perhaps understandable if not excusable.

Yours truly,
O. W. ROSKILL

THE "NASH" ENGRAVING

54 North Row,
London, W.1
19.12.38

To the Editor, JOURNAL R.I.B.A.

DEAR SIR,—The note beneath the John Nash engraving in the JOURNAL for 5 December says the reason for the giraffe and for Burton's Hyde Park screen needs explanation.

A detailed examination I was able to make of the original, thanks to the very kind assistance of the library staff, seems to show that the "Great Joss" is not Nash but his much caricatured patron, King George IV. The star (presumably of the Garter, though the design suggests the Saint-Esprit) and the bell shaped ornament over the head, which on investigation turns out to be St. Edward's Crown, seem conclusive proof. The absence of wind-swept wig and whiskers makes recognition difficult, but the features are comparable with most caricatures of the King.

The giraffe was the pride of the Royal menagerie at Sandpit Gate, Windsor, and there were many exaggerated accounts of the King's fondness for the beast, and of his distress at its death.

The cherry brandy in the other hand, the great paunch, and the legend "Oh 'tis Love 'tis Love 'tis Love," are all familiar in lampoons and caricatures of this monarch. His interest in military uniform and his weakness for dragons in interior decoration are not forgotten, and his 18th-century financial sense appears as the "Treasury teapot" boiling over golden sovereigns into the various monuments of the reign. Among these another work not by Nash is the "Intended Improvements at Windsor"; the slightly monkish figure holding these might be the mediaevalist Jeffrey Wyatville.

"Lots of Churches" is a typical Prinny remark. In the background of the huddle of steeples is one that looks very like All Souls, with Nash impaled as in the lower caricature.

May I congratulate the library on possessing the most comprehensive caricature of our most lampooned monarch that I have yet seen?

Yours truly,
JOHN PURSER

THE DESIGN OF WINDOW OPENINGS

9 Gray's Inn Square,
London, W.C.1
19.12.38

To the Editor, JOURNAL R.I.B.A.

SIR,—As one who for several years has studied natural illumination in a lonely minority of one, may I extend a warm welcome to Mr. Burnett's bold advocacy of the novel doctrine that windows should be designed with the object of lighting interiors. Many years ago they were. The result was the beautiful fenestration of Georgian houses in which some of us old fogies still take a keen, if senile, delight.

It is strange that in this age of blatant functionalism windows should still be designed merely as æsthetic features in a façade, and Mr. Burnett's article is indeed timely. There may be some charm in the perpetual twilight which obtains behind the low window heads of the typical modern house, but I have never been able to appreciate it.

Mr. Burnett's employment of simple "no-sky" lines, which have long proved invaluable in disputes and in defining and using criteria in town planning, to determine the height of window heads is quite correct and logical; although a more emphatic warning would have been desirable that "no-sky" lines can be not only incorrect but misleading if applied to anything but unbroken obstructions of uniform height, or to unduly narrow windows.

His geometrical short-cut for determining window width is less promising.

It is prefaced by, and may be based upon, his statement that window width is just as important as window height. This could only be true if a square foot of unobstructed glass at the bottom of a window afforded, in the more or less vertical directions in which light is usually required, the same illumination at table height as a square foot of unobstructed glass at the top of a window. Mr. Burnett would, I am sure, at once agree that this is not the case. His geometrical construction gives window widths in excess of those which in Georgian houses afford adequate light to the back of rooms facing the usual obstructions of Georgian streets.

It would also appear that when applied to an obstruction at a given distance away it gives the narrowest window for the severe condition C, i.e., such a height of obstruction as would permit of visible sky at table height extending only to one quarter of the depth of the room, and the widest window or the less severe condition A, i.e., such a height of obstruction as permits of visible sky at table height reaching to three-quarters of the depth of the room.

Any short cut to determine window width would be welcome, but there appears to be no present alternative to the partial, if substantial, short cut published in Paris and reprinted in *The Builder* of 1 October 1937 to which the article refers.

Yours faithfully,
PERCY J. WALDRAM [L.]

Obituaries

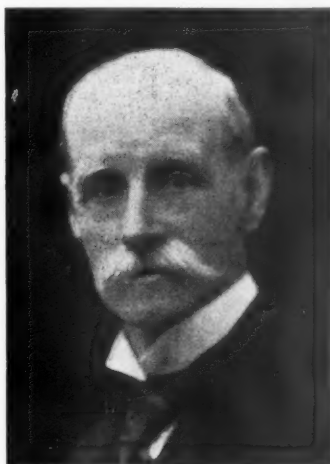
ARTHUR KEEN [F.]

We record with great regret the death on 15 December of Mr. Arthur Keen. He died at his home at Limpsfield, Surrey, after a long illness, at the age of 78.

Mr. Keen played a large part in the affairs of the R.I.B.A., of which he was honorary secretary from 1919 to 1921. He was a member of Council for twenty-one years, Vice-President from 1925 to 1927, a member of the Board of Architectural Education for many years, and its honorary secretary from 1917 to 1919; he also gave service on innumerable R.I.B.A. boards and committees, his most conspicuous service being as chairman of the Thames Bridges Conference, which was convened in 1925 under the auspices of the R.I.B.A. as an authoritative body to watch the proposals being made in that and subsequent years for the demolition of some and the erection of new bridges. The conference was representative of the Royal Academy, the Town Planning Institute, the Society for the Protection of Ancient Buildings (on whose initiative the original meeting was convened by the R.I.B.A. on 19 February 1929) and the Architecture Club. Mr. Keen's position as chairman was one of great responsibility which he fulfilled with distinction. The appointment of the Royal Commission on Cross River Traffic in 1926 was a direct outcome of the conference's work. The whole history of the Thames Bridges discussions and an idea of Mr. Keen's share in it can be gleaned from the R.I.B.A. Journals of the time and from a book, *Charing Cross Bridge*, which he wrote in 1930.

Arthur Keen was articled to Norman Shaw, having been educated at the City of London School. For some years he acted as assistant to Shaw and to other men before setting up in practice on his own at 4 Raymond Buildings, Gray's Inn, where he stayed for the whole of his professional career until he retired from active practice a few years ago. Among his buildings are the following:—The replanned meeting room in the R.I.B.A. Conduit Street building (1924); the North Islington Infant Welfare Centre (1929); Limpsfield Village Hall (1919); Oxted War Memorial Hospital; Kingsgate House, Holborn, for National Provincial Bank (1914); Waterloo Road Mission Hall, Uxbridge (1932); Ruskin House, Rochester Row, for William Morris & Co. (1905); and country cottages and small houses in Sussex, Surrey and Middlesex.

From 1910-11 he was President of the Architectural Association of which he had been an active member for many years.



He was a skilful draughtsman who found his chief recreation during his retirement in compiling a remarkable architectural graphic record of the villages of Limpsfield and Oxted. Some of these were exhibited at the R.I.B.A. in 1932 and in 1935, 1936 and 1937 Mr. Keen published three portfolios each containing twenty excellent reproductions. It would be difficult to name any other example in recent years in which a retired member of this profession had made such admirable, quiet and constructive use of his leisure, but the whole venture was characteristic of Arthur Keen, as was his precise, delicate and yet forceful style of draughtsmanship, absolutely devoid of frills and draughtsman's tricks, a bit "old-fashioned," perhaps, and charmingly so, but Mr. Keen was definitely more interested to show what the buildings were than to exhibit his emotions about them. They were works of good craftsmanship and guided by an accurate

sympathetic architect's eye rather than works of art—but Keen himself would never have claimed more for them.

The obituary in *The Times* rightly said of him: "... his character was marked by profound sincerity, unaffected modesty and a quality of earnestness which distinguished everything he undertook." It is not easy to write effectively about a man such as Arthur Keen, whose virtues were virtues of character that had little or nothing spectacular about them. He will be remembered by a large number of members of his profession for his friendship and helpfulness and will be remembered for a long time within the Institute, whose affairs benefited in so many ways by his patient, earnest work and his courteous person.

Mr. Stanley Hall [F.] writes:—

My first acquaintance with Arthur Keen dates back to thirty years ago when I sat for the Associateship examination and he was one of the examiners at my "viva." I remember how badly I had done in my design subject, and how valiantly—and I am grateful to say successfully—he tried to get me through on the strength of what I had done otherwise. This sympathetic attitude towards the young man was a characteristic which I met in him during the many years in which we were joint examiners at London University. It was because he was himself so young in outlook, keen in character as in name, and an enthusiast in his calling. In 1925 I succeeded him as Honorary Secretary after his six years of devoted service. He was a pattern for all holders of that office. Courteous, ready to help at all times, self-effacing, but having always a firm grip upon the affairs of the R.I.B.A. and the great interests

with which that body was concerned. In any cause in which his convictions were set he would spare himself nothing. His championship of Waterloo Bridge was his greatest and last architectural struggle. The work that he put in during that time taxed his powers too severely, and the death of his wife was a blow from which he never really recovered. We think of her with affection when she accompanied him, as she did so often, to the R.I.B.A. conferences. Their life at Limpsfield, among the villages and houses which he sketched so lovingly even in his late years, must have been an example of the happiness of a simply ordered life. We mourn our loss, and we salute him for his unselfish service to the profession which he loved.

We have received the following memoir of Mr. Keen from Mr. G. Alan Fortescue [F.] :—

The news of Mr. Arthur Keen's departure from this modern world has brought back to my mind vividly the happy days which I was privileged to spend with him in his offices at Raymond Buildings, Grays Inn.

I had the honour to be articled to Mr. Keen in the year 1908 when he shared offices with the late Mr. Ernest Newton.

What a treat it was to be associated with such architects and to be trained by one who was a pupil of Norman Shaw. One always felt in the office that you were doing something worth while, and even if only a pupil a future lay ahead under the guidance of such masters of architecture.

Thinking back on details of normal life in the office I can see Mr. Keen, the day's work done, coming into the room from the usual ablution, taking off his glasses, placing them on the mantelpiece, wiping his face with the towel and looking upon my drawing board with his dear words, "the drawing must be *Crisp*."

I feel that he embodied everything connected with detail, tidiness, law and order. Even his sketch books, which he showed me from time to time, were examples of thorough thinking and hard work, only to be produced by a fellow of the Norman Shaw school.

Mr. Arthur Keen was a grand master and used to take me out on many a journey of supervision and measurement, and would discuss with me the possibilities of detail.

He was passionately fond of children and I can see him now talking to them in the bus on our several journeys; it would seem that a loneliness was created within him that he had no child of his own.

He was the "father" of a staff at Raymond Buildings who loved him for the beauty of his mind, and I feel that most of the time he has spent in practice was spent in giving service to other people—he lying in the shadow all the time. Many a time have I called upon him when I was in practice, asking for advice which he freely gave, and I have seen him doing a great deal of work for the Institute—what a colossal job—out of love for an ideal.

CHARLES SPOONER [F.]

We regret to announce the death of Mr. Charles Spooner on Friday, 30 December. A memoir of Mr. Spooner will appear in the next number of the JOURNAL.

A. E. STREET [Ret. F.]

The following record of the career of the late Arthur Edmund Street is compiled from notes which we have received from Mrs. Street :—

Mr. Street was born in 1855. He was a King's Scholar at Eton, and after coming down from Magdalen College, Oxford, in 1878, he entered his father's office at 14a Cavendish Place, W. A very considerable time was spent at the Law Courts, which he completed in association with Sir Arthur (then Mr.) Blomfield after his father's death in 1881; but all the designing was in Street's hands and being so entirely in harmony with his father's work these later parts of the building are usually ascribed to him. At the time of his death a great number of unfinished works, large and important as many of them were, needed completion. A. E. Street was entrusted with them all. The American Church in Paris, of which G. E. Street had only made a sketch design, is perhaps the outstanding example of his work. Other works finished by him were St. James's, Paddington (on which building had not begun, but for which drawings had been made); the English Church and American clergy house, Rome; works at Salisbury, Tottenhall, etc.

Among his original works are: Flèche of St. Peter Mancroft, Norwich; tower of St. Mary's, Southampton; tower of St. John's, Torquay; Dewsbury Parish Church, chancel and transepts; St. Paul's, Worcester; Thring Memorial Chapel, Uppingham; St. Mary's Church, Speenhamland; works at St. Michael's, Smethwick, and various churches and chapels. He also made a design for Halifax Cathedral, Nova Scotia, and was responsible for part of its building.

When completing his father's work Street followed his footsteps most faithfully and sympathetically; but his own taste was not centred in Gothic architecture—yet that was what he was invariably asked for. His likings were for houses of a much later date.

Mr. Street's life interest, however, was not in architecture, the practice of which he gave up at the beginning of the century, but in literature, art and music. He wrote a *Memoir of George Edmund Street*, published in 1888; *Critical Sketches*, 1894 (a collection of his articles from Macmillan's and the Cornhill magazines); *Martial*, 1907 (120 epigrams translated into English verse); and short poems published in the *Pall Mall Gazette* (1908-11) and the *Bath and Wilts Chronicle* (1918). His real liking was for literature. He loved the classics and until the last year or two there was always in his pocket some little, much-thumbed volume of Greek poetry. Closest to his heart was the writing of verse; and it is hoped to publish before long a collection of his poems (most of which he was too diffident to publish).

But though in his creative work architecture did indeed take a second place, no other "visible" art enthralled him as did the sight and study of fine buildings ancient and even modern. In later years, though failing in strength and terribly deaf, he would return to his beloved London to wander alone the whole day round about the city and all the old precincts to bemoan the sad changes and to see the new

developments, and would come home utterly exhausted—worn out but satisfied.

J. H. HEYWOOD [F.]

Mr. James Herbert Heywood, whose sudden death on 24 October we regret to record, was born in 1861, and was articled to Mr. Joseph Stott, of Clegg Street, Oldham. In 1895 he entered into partnership with Mr. George Ogden, practising under the title Heywood and Ogden, and continued so after Mr. Ogden's death. The firm built numerous factories and cotton mills in Lancashire; the Westhulme Hospital; the Ashton Road, Oldham, Congregational Church; the Oldham Garden Suburb Housing Estate; the Oakwood Park Hotel, Conway. They also carried out housing work for many years for the Royton Urban District Council. Mr. Heywood was also well known for his restorations of old houses. One of his last pieces of work was the reconstruction of the Werneth Park Study Centre.

Mr. Heywood was vice-president of the Oldham Society of Architects, having been honorary secretary for many years. He was chairman of the Oldham Panel of Architects and a director of the Lancashire Land Company.

He was equally well known for his literary work as for his architecture. In Oldham, where he practised all his life, he founded the Lyceum Literary Society and was one of the oldest members of the Oldham Lyceum. He was also a playwright and librettist of operetta and a writer of fairy tales.

A. E. POWLES [F.]

Mr. Alfred Every Powles, who died on 7 November, practised for fifty years at Northwich, Cheshire.

He was born in 1862 and received his training in the office of Mr. John Douglas, of Chester. In 1888 he set up practice at Northwich, taking into partnership, in 1919, Mr. William King [F.], who succeeds him in the practice.

Among the buildings for which Mr. Powles was responsible are Sir John Deane's Grammar School, Northwich, the Victoria Road Council Schools, Northwich, and other schools in Cheshire; the Northwich branch of the Westminster Bank; many public houses including the Ring o' Bells, Weavesham, and the Slow and Easy, Lostock; the Delamere Golf Club buildings; and many rood screens, lych gates and war memorials.

Mr. Powles was a Justice of the Peace and a member of the Chester Diocesan Dilapidations Board.

ARTHUR J. PICTOR [F.]

Mr. Arthur Pictor, who died on 29 November, was born in 1861, and was articled to Mr. J. P. Seddon, Queen Anne's Gate. Later he spent a year sketching in France and elsewhere on the Continent.

Mr. Pictor first worked with Messrs. T. O. Bennett and Philip Bennett, land agents, at Bruton, Somerset. He set up practice in 1895 at Bath, and in July this year took into partnership Mr. Terence W. Snailum [A.], who continues the practice.

Mr. Pictor built a great number of schools all over Somerset, including the Memorial Buildings, King's School, Bruton and Sunny Hill Girls' School, Bruton; also numerous country and isolation hospitals; and housing and domestic schemes. He restored Hindon Priory at Hindon Charterhouse, Somerset, and also did a good deal of church repair and restoration work. Mr. Pictor was one of the diocesan surveyors for Bath and Wells.

F. HALL-JONES [F.]

We regret to record the death on 30 November of Alderman F. Hall-Jones. He was 72.

Mr. Hall-Jones, who was twice Mayor of Ealing, was the son of Mr. Charles Hall-Jones, Ealing's first borough surveyor, and was educated at University College School. Mr. Hall-Jones, who watched Ealing grow from a small village into a suburb with a population of 150,000, gave a large part of his energies to its planning. He was a member of the Town Council for 23 years, and was for long chairman of the Town Planning and Buildings Committee. In 1926 he became a member of the Middlesex County Council and was at one time chairman of the County Building Committee.

Among the buildings which he designed were Colston Hall, Bristol (since burnt down and rebuilt by Mr. Gordon Hake [F.]); the Westminster Bank, St. Mary Axe; factories at Birmingham, Liverpool, Exeter, and Portsmouth; the Linen and Woollen Drapers' Cottage Homes, Mill Hill; housing schemes at Dartford, Southall, and Uxbridge; and the Woodcote Park Estate and golf club house, Purley. At Ealing he built the hospital and St. John's and St. Paul's churches.

E. L. GAUNT [A.]

Mr. Edward Gaunt, whose death occurred on 7 November, was born in 1875 and was educated at the Bradford Grammar School. He received his training in the office of Messrs. Thomas Barker and Son, Bradford, and began to practise in 1897, in Bradford, until 1915, when he served in the war as a captain in the R.A.M.C. In 1920 he returned to architecture, and practised in Ilkley until his death.

Mr. Gaunt was architect of the Ilkley Electricity Showrooms, the West Yorks Bus Station, and the Home for District Nurses, besides numerous private houses in Ilkley and its neighbourhood.

W. F. EDWARDS [L.]

Mr. William Frederick Edwards, who died on 16 October, was educated at King Edward's School, Aston, and received his training at the Birmingham School of Art. He began to practise when he was 21 at Blackheath, but later moved to Birmingham. In his first year of practice he won a competition for a hospital at Porthcawl, Wales, and since then won many others for libraries, churches and schools. But Mr. Edwards' best known work was in designing modern bakeries. These he executed all over England, his last one being for the Allied Bakeries at Gateshead. Mr. Edwards was architect of the Abbey Road Council Schools, Bearwood, and the Conservative Club, Blackheath. For 24 years he was lecturer in building construction under the Oldbury and Rowley Regis Education Authorities.

The practice is being carried on by Mr. Edwards' partners, Mr. H. Cherrington [F.] and Mr. S. J. Stainton [F.], under the same name, W. F. Edwards, Cherrington and Stainton.

Notes

AIR RAID DEFENCE LEAGUE

The President has accepted an invitation to serve on the Council of the newly formed Air Raid Defence League.

ARCHITECT TO THE LONDON COUNTY COUNCIL

Mr. E. P. Wheeler [F.], Architect to the L.C.C. and Superintendent of Metropolitan buildings, is to retire next April after 40 years' service; he is 65 years of age. Mr. Wheeler will be succeeded by Mr. F. R. Hiorns, F.S.A. [F.].

MR. H. M. FLETCHER, HON. CORRESPONDING MEMBER, A.I.A.

Mr. H. M. Fletcher has been elected an Honorary Corresponding Member of the American Institute of Architects.

PROFESSOR R. M. BUTLER

At a General Assembly held on 18 July 1938, Professor R. M. Butler, A.R.H.A. [F.], of the School of Architecture, University College, Dublin, was elected a constituent member of the Royal Hibernian Academy of Arts. At a subsequent meeting he was elected Treasurer of the Academy.

PROFESSOR PERCY NOBBS AND

MR. W. L. SOMERVILLE

Professor Percy Nobbs [F.] has been elected a member of the Council of the Royal Canadian Academy of Arts, and Mr. W. L. Somerville [F.] has been made R.C.A.

BOOKS LEFT UNCLAIMED IN THE LIBRARY

Some months ago a reader in the Library left behind a copy of *The Design of Nursery and Elementary Schools*, by Myles Wright and Gardner-Medwin, and of the *Architectural Review* for December 1936. Unless these are claimed within a month from the publication of this notice they will be appropriated by the Library.

LECTURES ON BUILDING RESEARCH

A course of six lectures on building research subjects will be given by members of the staff of the Building Research Station at the Hackney Technical Institute, Dalston Lane, E.8, on Wednesday evenings, beginning 11 January 1939, at 8.15 p.m.

Subject	Lecturer	Date
Hydraulic cements..	T. W. Parker, M.Sc., Ph.D., A.I.C.	11 January 1939.
Limes and plasters..	A. D. Cowper, M.Sc., A.I.C.	18 January 1939.
Clay bricks and other burnt clay products.	B. Butterworth, B.Sc...	25 January 1939.
Asphalt in building	C. M. Watkins, M.Sc., Ph.D., A.I.C.	1 February 1939.
Paint on building materials.	H. M. Llewellyn, B.Sc., A.T.C.	8 February 1939.
Natural building stones.	J. Wallace, B.A.	15 February 1939.

Fee for course of six lectures, 5s. Further particulars can be obtained on application to the Principal.

THE KING ALBERT MEMORIAL LIBRARY COMPETITION

Mr. Herbert J. Rowse [F.] has been appointed to serve on a jury of four Belgian architects, three Belgian librarians, three foreign architects, one foreign librarian and the secretary of the fund to adjudicate a competition open to Belgian architects only for the King Albert Memorial Library at Brussels. The other foreign architect members of the jury are M. J. Kaufmann, of Berne, and M. E. Crevel, architect to the City of Paris.

R.I.B.A. DANCE CLUB

The following are the dates of the remaining dances at the R.I.B.A. during the current session:—Friday, 3 February 1939; Friday, 21 April 1939.

The dances will start at 9 p.m. and finish at 1 a.m. The price of tickets is 6s. each. Not more than ten tickets will be issued to any one person.

Applications must be accompanied by a remittance for the appropriate amount, and applications cannot be made by telephone. Applications for tickets should be sent as soon as possible to Mr. R. W. H. Robertson, Clerk to the Dance Club, at the R.I.B.A. Cheques and postal orders to be made payable to the R.I.B.A. Dance Club.

INSTITUTE OF LANDSCAPE ARCHITECTS

BOSTON CONGRESS, MAY 1939

The Institute of Landscape Architects, in collaboration with kindred bodies, is organising a deputation of landscape architects, architects, town planners and horticulturists to an International Congress in Boston, United States of America, next May. Special terms have been obtained from the Cunard White Star Line, and the sea trip, followed by six or seven days in Boston and a day's visit to the World Trade Fair in New York will cost approximately £77 a head cabin class, and £62 a head tourist class. This would be reduced to about £49 a head third class. Readers who would like to join the party would be welcomed by the Institute, and further information can be obtained from the Secretary, Institute of Landscape Architects, 38 John Street, W.C.1.

CITY AND GUILDS OF LONDON ART SCHOOL

124 KENNINGTON PARK ROAD

The City and Guilds of London Art School offers particularly good facilities to architects and architectural students who wish to gain some practical knowledge of, and do studies in, modelling, carving, sculpture, lettering, etching, and decorative painting. Special stress is laid on the relation of these to buildings, and on the just application of ornament to modern structure. The school is very freely run, and students are encouraged to pursue their individual studies. Every evening of the week, for instance, there is instruction in modelling, sculpture and painting from 6.30 to 9.30, and again on Saturdays from 10.30 a.m. to 5 p.m. There are also Life Classes daily from 10 a.m. to 3.30 p.m., and the studios are always open for people who can come in in the day-time.

A number of prizes and large Travelling Scholarships are given for work of real merit. The fees are almost nominal: ten shillings entitles a student to attend all the evening and Saturday classes for a term.

Further information may be obtained from the Registrar at 124 Kennington Park Road, S.E.11. (The school is one minute from Kennington Tube Station.)

Notes from the Minutes of the Council

5 DECEMBER 1938

National Register of Architects.

The draft letter and questionnaire prepared by the Emergency Panel Committee were approved and will be issued shortly.

Air Raid Precautions.

It was decided, on the recommendation of the Executive Committee, to set up a Committee on Air Raid Precautions with the following terms of reference:—

"To study the problem of structural A.R.P. in its technical relationship to architectural practice; to examine the results of British and foreign research, to supply information to members and others and to issue technical reports for publication in the Institute JOURNAL or elsewhere, subject to the approval of the Council."

*Examinations.**R.I.B.A. Summer Examinations, 1938.*

The Board of Architectural Education reported the results as follows:—

	Examined.	Passed.	Relegated.
Intermediate Examination	238	97	141
Final Examination	244	139	105
		(53 in Part 1 only, 1 in Part 2 only)	
Special Final Examination	62	19	43
		(8 in Part 1 only, 1 in Part 2 only)	

Examination in Professional Practice

for Students of Schools of Architecture

recognised for exemption from the

R.I.B.A. Final Examination

R.I.B.A. Intermediate Examination in Southern Rhodesia. May 1938.

The Board reported the results as follows:—

Examined.	Passed.	Relegated.
2	1	1

Schools of Architecture.

The following decisions were taken on the recommendation of the Board:—

Birmingham School of Architecture.

It was decided (1) that the recognition of the three years' full-time course for exemption from the R.I.B.A. Intermediate Examination be continued, and (2) that the recognition of the five years' full-time Diploma Course for exemption from the R.I.B.A. Final Examination be continued.

School of Architecture, King's College (University of Durham), Newcastle-upon-Tyne.

It was decided that the recognition of the first three years of the full-time Degree and Diploma Courses and the four years' part-time Certificate Course for exemption from the R.I.B.A. Intermediate Examination, and of the five years' Degree and Diploma Courses for exemption from the R.I.B.A. Final Examination be continued.

Department of Architecture, Municipal College, Southend-on-Sea.

It was decided that the recognition of the three years' full-time course for exemption from the R.I.B.A. Intermediate Examination be continued.

Exhibitions of Designs of Students Exempted from the R.I.B.A.

Intermediate and Final Examinations.

The Board reported that they found the general standard of the exhibitions satisfactory.

The R.A.I.A. Recognition of Schools.

The Board reported that the Board of Architectural Education of the Royal Australian Institute of Architects had granted recognition for exemption from the R.I.B.A. Final Examination to the School of Architecture of the Melbourne Technical College, Victoria.

The Aberdeen School of Architecture: Revised Course.

It was decided that the revised course of the Aberdeen School of Architecture be noted with approval.

Appointments.

Problems in Design and Testimonies of Study Examiners.

Mr. D. H. Beaty-Pownall [A.] in place of Mr. Anthony Minoprio [A.].

Thesis Examiners.

Mr. A. L. N. Russell [F.] in place of Mr. Kenneth M. B. Cross [F.].

Board of Moderators.

Mr. Sydney Tatchell [F.] and Mr. Oswald P. Milne [F.] in place of Mr. W. H. Ansell [F.] and Mr. L. Sylvester Sullivan [F.].
R.I.B.A. Representative on the Architectural Association Leverhulme Scholarship Committee.

Mr. Hubert Lidbetter [F.] in succession to Mr. A. H. Moberly [F.]

Finance and House Committee.

Mr. John L. Denman [F.].

Joint Meeting with the Institution of Heating and Ventilating Engineers and the Institute of Public Health and Hygiene to consider the Ventilation of Modern Rooms.

Mr. P. V. Burnett [F.] and Mr. J. Ernest Franck [F.].

British Standards Institution Conference on B.S. Specifications for Under-floor Ducts for Electrical Services for Use in Buildings (B.S. Nos. 774 and 815, 1938).

Mr. Walter Goodesmith [A.].

Women Members' Committee.

Miss O. M. Emmerson Price [A.].

Miss B. W. Bickerton [A.].

Obituary.

The Secretary reported with regret the death of Mr. G. C. Lawrence [F.], a former member of the Council and Vice-President in 1928-1929, and it was resolved to convey the sincere sympathy of the Council to the relatives of the late Mr. Lawrence.

Membership.

As Hon. Corresponding Members ..	3
As Hon. Associate	1
As Fellows	13
As Associates	131
As Licentiates	13

Election 9 January 1939.

Applications for membership were approved as follows:—

As Fellows	17 applications.
As Associates	39 "
As Licentiates	8 "

Election 3 April 1939.

Applications for membership from overseas candidates were approved as follows:—

As Fellows	2 applications.
As Associates	2 "

Reinstatements.

The following ex-members were reinstated:—

As Associate :	Winston Walker.
As Licentiates :	Arthur James.
	Henry John Welch.

Resignations.

The following resignations were accepted with regret:—

Reginald Wynn Owen [F.].
Paxton Watson [F.].
John Thomas Galletly [L.].
Reginald Arthur Victor Harrison [L.].
Herbert Hicks [L.].
William Mills [L.].
Major James Milne-Milne-Davidson [L.].
John Lombardini Northam [L.].
Israel Walker [L.].

Transfer to the Retired Members Class.

The following members were transferred to the Retired Members Class:—

As Retired Fellow :	James Gardner Gamble.
As Retired Associates :	George Rowland Ellis.
	Andrew Mitchell Torrance.
As Retired Licentiates :	Percy King Allen.
	William Unsworth.

Probationers

The following were enrolled as Probationers of the Royal Institute during the month of November 1938 :—

Albiston, Anthony William, *London*. Alden, Marguerite Yvonne, *Oxford*. Aldridge, David Olive Mooring, *Bournemouth*. Atkinson, Harry Hartley, *Houghton-le-Spring, Co. Durham*. Bailey, Douglas Carr, *London*. Barnes, Sidney James, *Greenford*. Beloff, Joseph Raymond, *London*. Blackburn, Alfred Norman, *Batley*. Blake-Kelly, John Robert Patrick, *Auckland, N.Z.*. Boddington, Peter, *Exmouth*. Brocklesby, Edward Willingham, *London*. Butler-Bowdon, Anthony William, *London*. Clarke, Arthur Derek, *Ashford, Kent*. Clerk, Theodore Shealtiel, *Edinburgh*. Clifford-Turner, Harry Dudley, *London*. Cole, George Lawrence Crozier, *London*. Cooper, Douglas John, *Coventry*. Croft, Paul Francis, *London*. Danks, James Thomas Arthur, *Smethwick, Staffs*. Dartnall, Kenneth James, *Westcliff-on-Sea*. Dingley, Jack, *nr. Atherstone, Warwick*. Dixon, Arthur, *Edinburgh*. Down, Geoffrey Langdon, *Chichester*. Ellis, James Christopher, *Mansfield*. Evans, Arthur Crook, *Aberystwyth*. Farr, Norman Sidney, *St. Helens*. Fielding, Allen Henry, *London*. Fong, Chee Eok, *Penang*. Francis, Leslie William, *London*. Freeman, David Peter, *Penarth*. Grubbe, David Cornwall, *London*. Hack, Robert Aylmer, *Canterbury*. Hallet, Owen Charles, *Salisbury*. Hartley, Harold Neil, *Colne, Lancs*. Harvey, John Percy, *Slough*. Hay, Ian Gordon McHattie, *Inverness*. Henman, Godfrey Stanley, *Oxford*. Hepburn, James Arthur, *Mill Hill*. Higgins, William Moore, *Selby*. Hiner, Walter Edward, *Cambridge*. Hogg, Murray Aitken, *Bicester*. Hussain, Saiyed Mohammed, *London*. Jermy, Eric Walter, *Norwich*. Johnson, David Alan, *London*. Jones, Douglas Donovan, *London*. Kershaw, Douglas John, *Rainham, Kent*. Killens, William Robert, *Thorpe Bay, Essex*. Kitchen, Hugh Harkett de Guvardie, *Oxford*. Lee,

John Wasdale, *Moor Park, Herts*. Leithead, Arthur Ernest, *Newcastle-on-Tyne*. Levien, Michael Stanley, *London*. Lodge, Ernest Richard, *Oxford*. McCrone, Douglas Haig, *Paisley*. MacRandal, Daniel Joseph, *Belfast*. Milligan, Stephen Glyndur Vaughan, *Hereford*. Mirza, Mehdi Ali, *London*. Morgan, Llewellyn Howell, *London*. Mountain, Bernard Hudson, *Wakefield*. Napier, John Reid, *West Anstruther, Fife*. Newcombe, Arthur Michael Lister, *Newcastle-on-Tyne*. Newland, Albert Christopher, *Oxford*. Nutter, Laurence Raymond, *Bingley, Yorks*. Outram, Jack, *Rotherham*. Packer, Ronald James, *Swansea*. Paget, Alfred Edgar, *E. Kirkby, Notts*. Parker, Clince, *Liverpool*. Pickering, Robert Gerald, *Bradford*. Pierpoint, Brian Wareing, *Wigan*. Pollard, Kenneth, *Leeds*. Rhatigan, Bernard Francis, *Dublin*. Richards, Roy Hamilton, *Blackpool*. Roberts, Valerie Jeanne, *Cardiff*. Robinson, Eric Cordukes, *York*. Roots, William Charles, *Ashford, Kent*. Rossi, Anthony, *Consett, Co. Durham*. Rudge, Dennis Alfred, *Nottingham*. Schofield, Frederick Bryce, *Accrington*. Scott, William, *W. Linton, Peeblesshire*. Shaw, Kenneth Vincent, *Schildon, Co. Durham*. Shield, Moira, *Sunderland*. Skinner, Basil Charles Dale, *London*. Smallbone, Edward, *Camberley*. Smith, Ronald Herbert Aubrey, *Shepperton-on-Thames*. Smithers, Frederick George, *London*. Snaith, Mary Cynthia Joan, *Darlington*. Stillman, John Cecil, *Chichester*. Taylor, Sheila Douglas, *Liverpool*. Te Water, Frans Karl, *London*. Thomerson, Robert Harold Charles, *Cowley, Middx*. Thompson, Peter Harburn, *Llandaff, Glam.*. Thomson, Edward George, *Glasgow*. Tinker, John Geoffrey, *Manchester*. Towler, Eric Robert, *Wisbech, Cambs*. Wainwright, Keith, *Cardiff*. Wallis, Duncan Lloyd, *Bridport*. Whitmore, Frederick Walter, *London*. Williams, Howard Owen, *Ystrad Rhondda, Glam.*. Wyler, Derek Roy, *Manchester*. Young, James Child Allendale, *S. Shields, Co. Durham*. Young, James Kenny, *Dundee*.

Notices

THE FIFTH GENERAL MEETING, MONDAY, 23 JANUARY 1939, AT 8.30 P.M.

The Fifth General Meeting of the Session 1938-39 will be held on Monday, 23 January 1939, at 8.30 p.m., for the following purposes :—

To read the minutes of the Fourth General Meeting held on Monday, 9 January 1939.

The President, Mr. H. S. Goodhart-Rendel, to present the Medals and Prizes, 1939, and to deliver his Address to Architectural Students.

Evening dress optional.

EXHIBITION OF PRIZE DRAWINGS 10-28 JANUARY 1939

The Annual Exhibition of Designs and Drawings submitted for the Prizes and Studentships 1939 will be open at the R.I.B.A. from Tuesday, 10 January to Saturday, 28 January 1939, inclusive. The Exhibition will remain open daily (Sundays excepted) free to the public between the hours of 10 a.m. and 8 p.m. (Saturdays 10 a.m. and 5 p.m.).

INFORMAL GENERAL MEETING,
WEDNESDAY, 1 FEBRUARY 1939, AT 6.30 P.M.
The Second Informal General Meeting of the Session will be held on Wednesday, 1 February 1939, when there will be a discussion on the Prizes and Studentships.
Mr. J. Brandon-Jones [A.] will be in the Chair.
Further details will be published in the next issue of the JOURNAL.

R.I.B.A. ANNUAL DINNER 1939

The Annual Dinner will take place on Friday, 10 February 1939, at 7 for 7.30 p.m. in the R.I.B.A. Henry Florence Hall, 66 Portland Place, W.1. Full particulars were contained in the circular letter to members enclosed with the JOURNAL for 5 December. Applications for tickets, which must be accompanied by cheques or postal orders, should be sent to the Secretary, R.I.B.A., not later than Wednesday, 11 January 1939.

ROYAL INCORPORATION OF ARCHITECTS IN SCOTLAND ANNUAL CONVENTION 1939

The Annual Convention of the Royal Incorporation of Architects in Scotland will be held within the area of the Edinburgh Architectural Association on Friday and Saturday, 2 and 3 June 1939, at Peebles.

ANNUAL SUBSCRIPTIONS

Members' subscriptions, Students' and Subscribers' contributions became due on 1 January 1939.

The amounts are as follows :—

Fellows	£5 5 0
Associates	£3 3 0
Licentiates	£3 3 0
Students	£1 1 0
Subscribers	£1 1 0

NOTE.—By a resolution of the Council dated 20 July 1931 the subscriptions of R.I.B.A. members in the transoceanic Dominions who are also members of Allied Societies in those

Dominions are reduced to the following amounts as from 1 January 1932 :—

Fellows	£3 3 0
Associates	£2 2 0
Licentiatees	£2 2 0

Members who are already registered under the Architects' Registration Act 1931 are reminded that the annual renewal fee of 10s. became due on 1 January 1939, and should be forwarded DIRECT to the Registrar, *The Architects' Registration Council*, 68 Portland Place, W.1.

COMPOSITION OF SUBSCRIPTIONS FOR LIFE MEMBERSHIP

Fellows, Associates and Licentiatees of the Royal Institute may become Life Members by compounding their respective annual subscriptions on the following basis :—

For a Fellow by a payment of £73 10s. (70 guineas).

For an Associate or Licentiate by a payment of £44 2s. (42 guineas), with a further payment of £29 8s. (28 guineas) on being admitted as a Fellow.

In the case of members in the transoceanic Dominions who are members of Allied Societies in those Dominions, the following basis will operate :—

For a Fellow by a payment of £52 10s. (50 guineas).

For an Associate or Licentiate by a payment of £31 10s. (30 guineas), with a further payment of £21 (20 guineas) on being admitted as a Fellow.

Provided always that in the case of a Fellow or Associate the above compositions are to be reduced by £1 1s. per annum for every completed year of membership of the Royal Institute after the first five years, and in the case of a Licentiate by £1 1s. per annum for every completed year of membership of the Royal Institute, with a minimum composition of £6 6s. in the case of Fellows and £4 4s. in the case of Associates and Licentiatees.

CLASSES OF RETIRED MEMBERS

Under the provisions of Byelaw No. 15 applications may be received from those members who are eligible for transfer to the class of "Retired Fellows," "Retired Associates," or "Retired Licentiatees."

The Byelaw is as follows :—

"Any Fellow, Associate or Licentiate who has reached the age of fifty-five and has retired from practice may, subject to the approval of the Council, be transferred without election to the class of 'Retired Fellows,' 'Retired Associates' or 'Retired Licentiatees,' as the case may be, but in such case his interest in, or claim against the property of, the Royal Institute shall cease. The amount of the annual subscription payable by such 'Retired Fellow,' 'Retired Associate' or 'Retired Licentiate' shall be £1 1s. od., or such amount as may be determined by resolution of the Council, excepting in the case of those who have paid subscriptions as full members for thirty years, and who shall be exempt from further payment. A 'Retired Fellow,' 'Retired Associate' or 'Retired Licentiate' shall have the right to use the affix of his class with the word 'Retired' after it, shall be entitled to receive the *JOURNAL* and *Kalendar*, shall be entitled to the use of the Library, and

shall have the right to attend General Meetings, but shall not be entitled to vote. A 'Retired Fellow,' 'Retired Associate' or 'Retired Licentiate' shall not engage in any avocation which in the opinion of the Council is inconsistent with that of architecture. Nothing contained in this Byelaw shall affect the rights of persons who at the date of the passing of this Byelaw are members of the classes of 'Retired Fellows' and 'Retired Members of the Society of Architects.'"

BRITISH ARCHITECTS CONFERENCE,

DUBLIN, 21-24 JUNE 1939

The Annual Conference this year of the Royal Institute of British Architects and its Allied and Associated Societies will be held in conjunction with the Centenary Celebration of the Royal Institute of the Architects of Ireland and will take place at Dublin from 21 to 24 June 1939.

The Royal Institute of the Architects of Ireland have in hand the preparation of a most attractive programme and particulars will be issued in due course.

THE USE OF TITLES BY MEMBERS OF THE ROYAL INSTITUTE

In view of the passing of the Architects Registration Act 1938, members whose names are on the Statutory Register are advised to make use simply of the title "Chartered Architect" after the R.I.B.A. affix. The description "Registered Architect" is no longer necessary.

Members who are qualified for registration and have not already done so are reminded of the importance of applying for such registration without delay. Full particulars will be sent on application to the Secretary R.I.B.A.

LICENTIATES AND THE FELLOWSHIP

By a resolution of the Council passed on 4 April 1938, on and after 1 January 1939 all candidates whose work is approved will be required to sit for the examination, which will be the design portion of the Special Final Examination, and no candidates will be exempted from the examination.

NOTE.—The above resolution will not affect Licentiatees of over 60 years of age applying under Section IV, Clause 4 (c) (ii) of the Supplemental Charter of 1925.

ASSOCIATES AND THE FELLOWSHIP

Associates who are eligible and desirous of transferring to the Fellowship are reminded that if they wish to take advantage of the election to take place on 6 March 1939 they should send the necessary nomination forms to the Secretary R.I.B.A. not later than Saturday, 14 January 1939.

THE RECEPTION OF NEW MEMBERS AT GENERAL MEETINGS

It has been decided by the Council to modify the procedure for the introduction and reception of new members at General Meetings. In future new members will be asked to notify the Secretary beforehand of the date of the General Meeting at which they desire to be introduced and a printed postcard will be sent to each newly elected member for this purpose. They will be asked to take their seats on arrival in a special row of seats reserved and marked for them. At the beginning of the meeting, on the invitation being given to present themselves for formal admission, each

new member will be led up to the Chairman by one supporter, and the Chairman will formally admit him to membership.

The introduction and reception of new members will take place at any of the forthcoming Ordinary General Meetings of the Royal Institute with the exception of the meetings on the following dates :—

23 January 1939 (Presentation of Prizes).

3 April 1939 (Presentation of Royal Gold Medal).

THE R.I.B.A. REGISTER OF ASSISTANTS SEEKING ENGAGEMENTS

Members and Students of the R.I.B.A. and the Allied and Associated Societies are reminded that a Register of Assistants seeking engagements is kept at the offices of the Royal Institute.

An assistant seeking employment should obtain from the Secretary R.I.B.A. the necessary form (to be filled up in duplicate) on which particulars must be given as to the applicant's age, qualifications, salary required, references, etc.

The application will hold good for one month from the date of receipt, after which it must be renewed on a fresh form unless the applicant has meanwhile obtained employment.

Architects, whether members of the R.I.B.A. or not, will be furnished on application with the names and addresses of persons desiring employment as assistants, improvers or clerks of works as the case may be. Architects applying for assistants should give the following particulars of their requirements : (1) whether temporary or permanent engagement ; (2) junior or senior assistants ; (3) particulars of duties and style of work ; (4) salary offered.

ARCHITECTURAL COMPETITIONS ASSESSORS' AWARDS

All architects who take part in architectural competitions are reminded by the Council of the R.I.B.A. that participation in a competition is a definite acceptance of the principle that the award of the assessor is final and binding upon themselves as well as upon the promoters, and that any competitor who feels that he has real ground for dissatisfaction with an assessor's award should communicate with the Secretary of the R.I.B.A.

Further, all architects, whether competitors or otherwise, are reminded that discussion or correspondence in the public or professional Press which tends to criticism or disparagement of an assessor or award cannot alter the final and binding effect of the award, but may prejudice architects and the whole competition system in the opinion of the public, and is, therefore, highly undesirable.

PUBLICITY

The Practice Committee recommend members to see that when writing or approving an article or descriptive note for the Press, technical or otherwise, relating to a completed building, the names of the quantity surveyor and contractor are always mentioned.

DRAFT FORM OF AGREEMENT BETWEEN A LOCAL AUTHORITY AND A FIRM OF ARCHITECTS

In view of recent changes in legislation and the revision in 1933 of the Scale of Professional Charges, the Council, on the

recommendation of the Practice Committee, have revised the Draft Form of Agreement between a Local Authority and a firm of architects first issued in 1931.

The revised Draft is a short form embodying by reference the Scale of Professional Charges and the Conditions of Engagement which are part of the Scale, and has been arranged with alternative clauses to apply either in cases in which the appointment is the result of a competition or in cases in which the appointment is not the result of a competition.

Copies of the revised Draft Form of Agreement may be obtained upon application to the Secretary R.I.B.A.

THE NATIONAL ASSOCIATION OF WATER USERS

Members are reminded that the National Association of Water Users, on which the R.I.B.A. is represented, exists for the purpose of protecting the interests of consumers.

Members who experience difficulties with water companies, etc., in connection with fittings are recommended to seek the advice of the Association. The address of the Association is 46 Cannon Street, London, E.C.4.

OVERSEAS APPOINTMENTS

When members are contemplating applying for appointments overseas they are recommended to communicate with the Secretary R.I.B.A., who will supply them with any available information respecting conditions of employment, cost of living, climatic conditions, etc.

Competitions

The Council and Competitions Committee wish to remind members and members of Allied Societies that it is their duty to refuse to take part in competitions unless the conditions are in conformity with the R.I.B.A. Regulations for the Conduct of Architectural Competitions and have been approved by the Institute.

While, in the case of small limited private competitions, modifications of the R.I.B.A. Regulations may be approved, it is the duty of members who are asked to take part in a limited competition to notify the Secretary of the R.I.B.A. immediately, submitting particulars of the competition. This requirement now forms part of the Code of Professional Practice in which it is ruled that a formal invitation to two or more architects to prepare designs in competition for the same project is deemed a limited competition.

BEDWORTH, WARWICKSHIRE : NEW COUNCIL OFFICES

The Bedworth Urban District Council invite registered architects whose offices are situated in Warwickshire to submit in competition designs for new Council Offices to be erected on a site fronting High Street, Bedworth.

Assessor : Mr. S. N. Cooke [F.].

Premiums : £50, £25 and £15.

Last day for submitting designs : 31 January 1939.

Last day for questions : 31 October 1938.

Conditions of the competition may be obtained on application to Mr. Maurice Armson, Clerk of the Council, Council Offices, Bedworth, near Nuneaton. Deposit £1 is.

EDINBURGH: NEW EXHIBITION HALL

The Lord Provost, Magistrates and Council of the City of Edinburgh invite architects in association with consulting engineers, both resident in Great Britain, to submit in competition designs for an Exhibition Hall, to be erected on the site of the present Waverley Market, Princes Street, Edinburgh.

Assessor: Mr. Thomas S. Tait [F.].

Premiums: 500 guineas, 300 guineas and 200 guineas.

Last day for submitting designs: 31 August 1939.

Last day for questions: 15 February 1939.

Conditions and instructions to competitors may be obtained on application to The Town Clerk, City Chambers, Edinburgh, 1. Deposit £2 2s.

GODALMING: NEW MUNICIPAL BUILDINGS

The Godalming Borough Council invite architects of British nationality to submit in competition designs for new Municipal Offices.

Assessor: Mr. Stanley C. Ramsey [F.].

Premiums: £200, £150 and £100.

The last day for submitting designs has been extended to 28 February 1939.

Last day for questions: 31 October 1938.

HUTTON, NEAR PRESTON, LANCs: NEW POLICE HEADQUARTERS

The Lancashire Standing Joint Committee for Police and other purposes invite chartered and/or registered architects to submit in competition designs for a new General Police Headquarters and Training School to be erected at Hutton, near Preston.

Assessor: Sir Percy Worthington, Litt.D., F.S.A. [F.].

Premiums: £500, £400 and £300.

Last day for submitting designs: 1 May 1939.

The last day for questions has been brought forward to 28 January 1939.

Conditions of the competition were obtainable on application before 5 December 1938 to Sir George Etherton, Clerk of the Peace, County Hall, Preston. Deposit £3 3s.

LAGOS, NIGERIA: NEW SUPREME COURT HOUSE

The Government of Nigeria invite architects of British nationality and resident in Great Britain and Africa who are members of the R.I.B.A. or of its Allied Societies to submit in competition designs for new Supreme Courts in Lagos, Nigeria.

Assessor: Mr. A. F. B. Anderson [F.].

Premiums: £500, £300 and £200.

Last day for submitting designs: 30 June 1939.

Last day for questions: 14 February 1939.

Conditions of the competition may be obtained on application to The Crown Agents for the Colonies, 4 Millbank, Westminster, London, S.W.1. Deposit £1 1s.

ST. GEORGE'S HOSPITAL: RECONSTRUCTION

The President, Vice-President, Treasurer and Governors of St. George's Hospital invite architects practising in the United Kingdom and Northern Ireland to submit in competition designs for the reconstruction of St. George's Hospital, Hyde Park Corner.

Assessors: Dr. H. V. Lanchester [F.].

Mr. T. A. Lodge [F.].

Premiums: £500, £300 and £200.

The last day for submitting designs has been extended to 14 January 1939.

Last day for questions: 1 March 1938.

SHREWSBURY: NEW SENIOR SCHOOL

The Corporation of Shrewsbury invite architects to submit in competition designs for a new Senior School to be erected at Broom Hall, Ellesmere Road, Shrewsbury.

Assessor: Mr. C. Cowles-Voysey [F.].

Premiums: £200, £150 and £100.

The last day for submitting designs has been extended to 30 January 1939.

Last day for questions: 10 September 1938.

FORTHCOMING COMPETITIONS

Other competitions which it is proposed to hold, and the conditions for which are not yet available, are as follows:—

BRIGHOUSE: NEW MUNICIPAL BUILDINGS
Assessor: Mr. James R. Adamson [F.].

EDMONTON: NEW TOWN HALL BUILDINGS
Assessor: Mr. E. Berry Webber [A.].

OLDHAM: ELECTRICITY OFFICES AND DEPARTMENTAL BUILDINGS
Assessor: Professor R. A. Cerdingley [F.].

WREXHAM: NEW TOWN HALL
Assessor: Mr. Herbert J. Rowse [F.].

COMPETITION RESULT

BRIERLEY HILL, STAFFS: NEW MUNICIPAL BUILDINGS

1. Mr. Hugh P. Crallan [A.] (London).
2. Mr. Eric G. Broughton [A.] (London).
3. Messrs. W. F. Granger [F.] and E. Pearce [A.] (London).

MEMBERS' COLUMN

Owing to limitation of space, notices in this column are restricted to changes of address, partnerships vacant or wanted, practices for sale or wanted, office accommodation, and appointments vacant. Members are reminded that a column in the Advertisement Section of the Journal is reserved for the advertisements of members seeking appointments in architects' offices. No charge is made for such insertions and the privilege is confined to members who are definitely unemployed.

NEW PARTNERSHIPS

MESSRS. LANCHESTER & LODGE [FF.] have pleasure in stating that the name of their partner, Mr. E. E. Davis [A.], will in future be added to the style of the firm, which will be known as Messrs. Lanchester, Lodge & Davis. They are also taking into partnership Mr. Robert Lanchester [A.], as from 1 January 1939.

MESSRS. GUNTON & GUNTON (W. H. Gunton [F.] and E. N. Clifton [F.]) regret to announce that owing to ill-health Mr. T. A. Moodie [F.] retired from the firm at the end of 1938. In his place they have appointed Mr. H. Gilford [F.], who has been with them for many years, to a junior partnership in the firm.

MR. G. E. MATKIN, F.S.I. [L.], of Barclay Chambers, Fawcett Street, Sunderland, Co. Durham, has taken into partnership Mr. George H. Hawkins [A.] as from 1 December. The practice will continue to be carried on at the above address under the style of Matkin & Hawkins.

NEW APPOINTMENT

On the retirement on 31 December of Mr. A. Blomfield Jackson [F.], after 35 years' service as a surveyor for the Diocese of London under the Ecclesiastical Dilapidations Acts, the Dilapidations Board have invited Mr. W. Chas. Waymouth [F.] to fill the vacancy, which invitation he has accepted.

DISSOLUTIONS OF PARTNERSHIP

MR. V. C. L. SAUNDERS [A.] has now left the firm of Messrs. L. A. Culliford & Partners on taking up a position with the Air Ministry. The remaining partners, Mr. L. A. Culliford [F.] and Mr. L. A. Chackett [A.], will continue the practice at the same address, 47 Essex Street, Strand, W.C.2.

THE partnership hitherto existing as Watkin & Maddox, Chartered Architects, Burslem, Stoke-on-Trent, has terminated. Mr. E. T. Watkin [F.] will continue to practise at Burslem under his own name only, while Mr. F. Morrall Maddox [A.] has started practice at Cathcart Chambers, High Street, Stourbridge, Worcs.

PARTNERSHIPS WANTED

EXPERIENCED member, having been compelled to leave his practice in the Far East, owing to hostilities, would like to assist provincial architect with a view to partnership, or would accept responsible supervisory position. Small capital available.—Box 9128, c/o Secretary R.I.B.A.

STUDENT R.I.B.A., Registered Architect (34), with considerable experience, used to carrying jobs through unaided, desires a position as partner in a practice in London, Surrey or Sussex with a good connection. Capital available.—Reply Box 4139, c/o Secretary R.I.B.A.

AMALGAMATION OF PRACTICES WANTED

WEST COUNTRY member wishes to amalgamate busy provincial practice with established London office.—Box 2812, c/o Secretary, R.I.B.A.

CHIEF ASSISTANT WANTED

ARCHITECT requires permanent chief assistant for large varied practice in East Anglia, A.R.I.B.A. standard; must be thoroughly capable; state age, salary and experience.—Box 8128, c/o Secretary R.I.B.A.

OFFICE ACCOMMODATION WANTED

ASSOCIATE, 33, wishes to rent a well-lit room adjoining another architect's office and to share services of secretary. Space would also probably be required for an assistant.—Reply Box 7128, c/o Secretary R.I.B.A.

OFFICE ACCOMMODATION TO LET

To let, large well-lighted single office in Old Bond Street, W.1. Furnished or unfurnished. Secretarial services if required. Exceptionally suitable for provincial or country firm requiring town address.—Box 2912, c/o Secretary R.I.B.A.

FELLOW has vacant good sized office on first floor, with drawing bench, cupboard and water, in W.C. area. Rent £45 p.a. Telephone and clerical services available.—Box 2312, c/o Secretary R.I.B.A.

ASSOCIATE with suite of offices on first and second floor in good house in Bloomsbury Square, W.C.1, desires an architect to share the accommodation and can have the services of staff by arrangement. Very reasonable rental.—Apply Box 6128, c/o Secretary R.I.B.A.

CHANGE OF ADDRESS

ON and after 2 January 1939 Mr. Thomas E. Scott [F.] will transfer his office to 2 Gray's Inn Square, W.C.1. Telephone: Chancery 8126.

TRADE CATALOGUES WANTED

MR. A. GRAHAM [A.] has now removed from 50 Church Crescent, London, N.10, to 70 Manor Green Road, Epsom, telephone Epsom 2192, where he would be pleased to receive trade catalogues, etc.

BIRTH

22 DECEMBER, to Lorna (née McLay) [A.], wife of R. Fraser Reekie [A.], 27 Eton Place, London, N.W.3, a son, Alan Fraser Reekie.

Architects' and Surveyors' Approved Society

ARCHITECTS' ASSISTANTS' INSURANCE FOR THE NATIONAL HEALTH AND PENSIONS ACTS

Architects' Assistants are advised to apply for the prospectus of the Architects' and Surveyors' Approved Society, which may be

obtained from the Secretary of the Society, 113 High Holborn, London, W.C.1.

The Society deals with questions of insurability for the National Health and Pensions Acts (for England) under which, in general, those employed at remuneration not exceeding £250 per annum are compulsorily insurable.

In addition to the usual sickness, disablement and maternity benefits, the Society makes grants towards the cost of dental or optical treatment (including provision of spectacles).

No membership fee is payable beyond the normal Health and Pensions Insurance contribution.

The R.I.B.A. has representatives on the Committee of Management, and insured Assistants joining the Society can rely on prompt and sympathetic settlement of claims.

Architects' Benevolent Society

66 PORTLAND PLACE, W.1

FOUNDED 1850

The object of the Society is to afford assistance to architects, architects' assistants, and their widows and children by means of grants and pensions.

Subscriptions and donations of any amount are urgently needed. An annual subscriber of £1 1s. is entitled to recommend annually two applicants for relief.

A.B.S. INSURANCE DEPARTMENT

PENSION AND FAMILY PROVISION SCHEME FOR ARCHITECTS

This scheme has been specially designed by the A.B.S. Insurance Committee for members of the R.I.B.A. and its Allied and Associated Societies. It provides:—

1. A pension for members on retirement at age 65.
2. Widows' pension—payable to the widow from the time when, if the member had lived, he would have attained age 65.
3. Family protection—if the member dies before age 65 a yearly payment is made to his dependants from the date of his death till Benefit No. 2 becomes available.

The benefits may be purchased in units of £50 per annum up to a maximum of £500 per annum.

Please write for full particulars to the Secretary, A.B.S. Insurance Department, 66 Portland Place, London, W.1. Telephone: Welbeck 5721.

It is desired to point out that the opinions of writers of articles and letters which appear in the R.I.B.A. JOURNAL must be taken as the individual opinions of their authors and not as representative expressions of the Institute.

Members sending remittances by postal order for subscriptions of Institute publications are warned of the necessity of complying with Post Office Regulations with regard to this method of payment. Postal orders should be made payable to the Secretary R.I.B.A. and crossed.

Members wishing to contribute notices or correspondence must send them addressed to the Editor not later than the Tuesday prior to the date of publication.

Back numbers of the JOURNAL can be obtained at the price of 1s. 6d., including postage throughout the world. For orders of more than six copies discounts are given. Orders must be prepaid.

R.I.B.A. JOURNAL

DATES OF PUBLICATION.—1939.—23 January; 6, 20 February; 6, 20 March; 3, 24 April; 8, 22 May; 12, 26 June; 17 July; 14 August; 18 September; 16 October.

1939

born,

tional
neral,
nnum

ernity
tal or

h and

unage-
rompt

y

archi-
ildren

gently
ecom-

ETS
urance
ociated

when,
5.
yearly
death

um up

urance
phone :

les and
a as the
entative

riptions
ng with
yment.
I.I.B.A.

ce must
y prior

price of
ders of
repaid.

bruary;

ne; 17

BUILDING SCIENCE

QUESTIONS *and* ANSWERSNOTES FROM THE INFORMATION BUREAU OF
THE BUILDING RESEARCH STATION*

(4th Series, No. 6)

From time to time there have been included in these Notes discussions of selected topics not necessarily related to specific questions addressed to the Station, but rather a reflection of a body of inquiries submitted. There are a number of such topics which it is thought could usefully be discussed in that way, and it has therefore been decided that for a period of twelve months or so these Notes shall take the form essentially of such discussions. It is not intended, however, to adhere rigidly to this form, for any inquiries of special interest that may be received by the Station during the period will be dealt with as before.

DIRECTOR OF BUILDING RESEARCH.

NATURAL STONE MASONRY

PART I—ITS DECAY, PRESERVATION AND REPAIR

The following note is a summary of available knowledge—the treatment is not exhaustive. It is presented in the hope that it may be found useful as a convenient résumé of existing information.

Natural stone is one of the oldest of building materials, and there are abundant examples of historic buildings which have withstood the ravages of the weather for centuries and suffered no more than a pleasing mellowing. But there are also numerous examples of buildings of more recent date, which, within a few years, have developed disfiguring stains and serious erosion or decay.

To-day, owing to the cost of natural stone in most districts, its use tends to be reserved for the more important buildings, many of which must have a good expectation of life. The durability of the stone is, therefore, of considerable importance. The desire to preserve works, monumental and otherwise, of historic or artistic interest, brings to the fore also the question of repair and preservation. The present note is intended to explain the factors responsible for the varied behaviour of stone masonry and to indicate what steps should be taken, in the first place, to ensure that new work will behave well, and in the second place, what methods should be adopted with old buildings needing repair to ensure that the results, in addition to being aesthetically satisfactory, will also be sound from a structural point of view.

CAUSES OF DECAY

The mistake is often made of adopting a fatalistic attitude to the problem of decay of stonework,

as though there were some inherent agent of decay in certain types of stone or certain parts of a building against which nothing can really avail. For example it has been suggested that decay of stone is largely a kind of disease, due to the action of bacteria or fungi, to which the stone is subject. Certainly such organisms are often found in decaying stone, but they are also frequently present in sound stone and no generally accepted evidence has been adduced to show that they are an important cause of the disintegration which occurs. Much can be done to avoid decay by proper selection of the stone and attention to constructional details.

The following brief summary covers the important causes of decay, so far as they are known to-day. It must not be regarded as a comprehensive scientific description of the phenomena involved, for which reference should be made to a report on "The Weathering of Natural Building Stones" by R. J. Schaffer (149 pp.) published by H.M. Stationery Office, price 4s. 6d. net.

1. Frost

The injury of stone by frost is analogous to the bursting of water pipes from the same cause. When water freezes there is an increase in volume of about ten per cent., and it follows that a stone which becomes saturated and is subject to frost action in that condition is liable to be disintegrated

* Crown Copyright Reserved

sooner or later, unless the ice can be thrust out of the stone during freezing. But whether a particular stone suffers injury from frost depends on various factors, some of which are connected with the properties of the stone while others depend on design and construction. A few of the commonly used building stones readily absorb water to such an extent that all the pores become full or nearly full of water. Freezing can then cause injury. It is, however, only in certain positions on a building that the pores can become filled to a dangerous degree. If the masonry is protected from excessive absorption, no injury will occur. In England damage by frost is rare except in retaining walls, or in unprotected parapets, copings, string courses and so on. Those stones which, because of their absorptive properties, are liable to frost injury must be suitably protected at the "danger-points."

Other kinds of stone may be regarded as frost resistant. This is mainly because, even if freely exposed, they do not absorb water to such an extent that the pores become filled: there is, therefore, always some room for expansion when ice forms. Portland stone of good quality and many of the sandstones are in this class.

By laboratory tests it is possible to pick out with a fair degree of certainty the stones which are liable to become waterlogged. The problem of selection for full exposure to the weather is complicated somewhat if there is a marked tendency to stratification or lamination, but, broadly speaking, frost action is governed by the above considerations.

2. Solution

Building stones differ markedly as regards the action of rain upon them. Sandstones in which the constituent sand grains are bonded with silica are quite insoluble in water, and constant washing of water over the surface for centuries produces no noticeable effect. In the soot-laden atmosphere of large towns, stones of this kind become uniformly blackened. On the other hand, limestones, and sandstones in which the grains are bonded with carbonate of lime, are slightly but appreciably soluble in water. The effect of water on the surface is a very slow removal of material without flaking, powdering or similar effects. It will at once be appreciated that this action can only reach serious proportions on certain features of a building and the appropriate protective measures immediately suggest themselves. Incidentally, the stone keeps clean due to constant washing, whereas in more sheltered areas soot and dirt accumulate. In towns, where the rain water is rendered acid by the products of

coal combustion, solution and erosion are accentuated. However, this type of action is relatively unimportant except in its indirect influence on the form of decay due to skin formation described later.

3. Soluble Salt Action

Most stones are porous to some extent, the most important exception being granite, and because of the presence of pores they are liable to injury if soluble salts are introduced. The exact mechanism of the effect is not yet understood, but it is known that the salts are continually carried about in the pores of the stone by movement of moisture, alternately crystallising and dissolving, or, it may be, absorbing moisture from the air and expanding. It seems that the structure of the stone is continually being disturbed by the action so that a slow powdering and disintegration occurs: Some stones are much more seriously injured by this salt action than others, and within the same class of stones, for example limestones, some are more easily injured than others. Even in the same quarry some beds may be resistant and others susceptible, though it may be almost impossible to distinguish them by inspection. Portland stone is a case in point. The reputation of Whitbed stone is due to its higher resistance to crystallisation forces. The risk of injury from salt action depends upon the size, shape and amount of pores in the stone, and by microscopical examination it is possible to pick out the good from the poorer beds in certain familiar kinds of stone. Laboratory tests are available which enable resistant stones to be identified with considerable confidence. One of these consists simply in reproducing, in an intense degree, the effect of crystallisation by introducing into the pores of the stone a concentrated solution of sodium sulphate. Samples that behave well in this test behave well in buildings and *vice versa*.

There are then inherent differences in the susceptibility of types of stone, or individual blocks of stone, in a building, to the action of soluble salts, but a weakness from this cause may be much less serious if steps are taken to prevent excessive quantities of salts reaching the stone. Conversely, if contamination by salts is permitted, even the resistant stones may suffer rapid decay. Factors external to the stone are involved. Brickwork backings to masonry may be important sources of salts, and to prevent injury from this cause the backs and sides of the blocks of stone should be given a bitumen coating. Figure 1 illustrates an unusual but interesting case of soluble salt action in the stone facings of

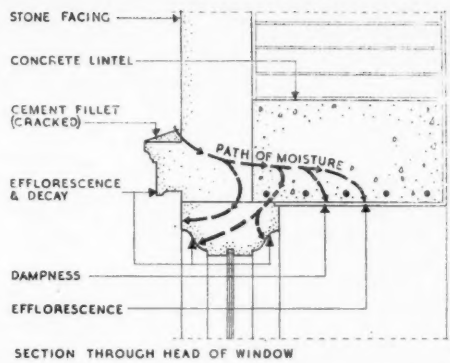


FIGURE 1. Decay caused by soluble salts derived from concrete lintel.

a school building, where the soluble material was derived from concrete behind the masonry.

Damp-proof Courses.—The soil is an inexhaustible source of soluble salts, and any moisture which passes into the fabric of a building due to a defect in the damp-proof course will carry these

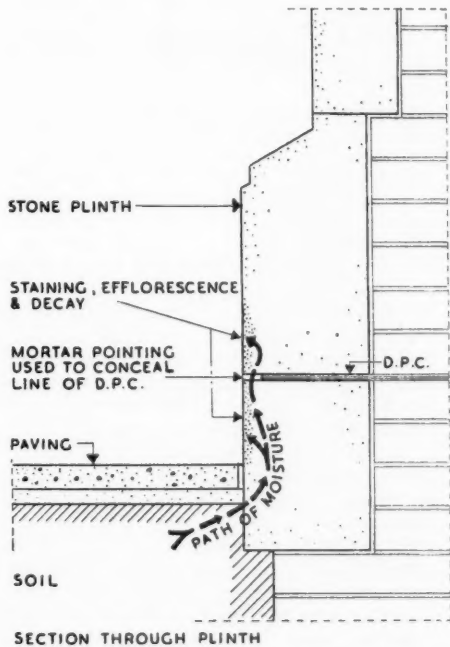


FIGURE 2. Decay caused by soluble salts derived from soil.

salts with it. Fortunately the concentration of salts is usually small, but the continuous absorption of small quantities of injurious matter may in a few years bring about serious disfiguration. The presence of clinker filling—often rather rich in salts—in contact with masonry increases the rate and amount of injury from this source. Figure 2 illustrates one case which was investigated of decay and discolouration of Portland stone above the damp-proof course. To mask the dark line of the asphalt damp-course it was set back in the wall an inch or so and finished with cement mortar. After a year or two there were brown stains and salt growths at the positions shown in the diagram and the stone was observed to be pitting. After the mortar pointing had been removed and the stone had been washed a few times at intervals the staining commenced to disappear and the trouble cleared.

Figure 3 illustrates another case where, owing to the paving being laid at a higher level than was expected, the damp-proof course was rendered ineffective as a barrier for soil salts, though it was in fact quite effective in preventing moisture from reaching the inside of the building. The

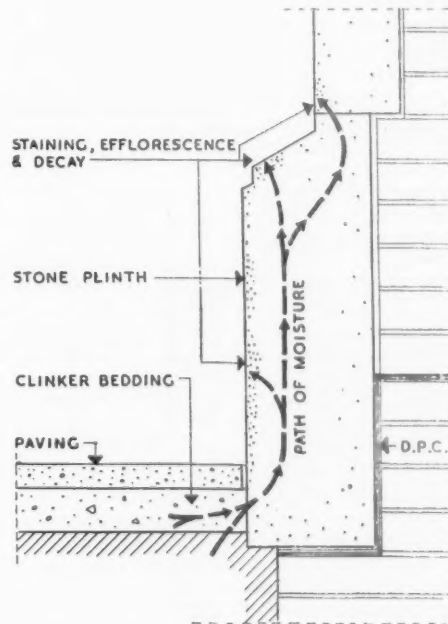


FIGURE 3. Decay caused by soluble salts derived from clinker bedding below paving.

trouble was made worse than usual by the use of clinker as a bedding for the paving stones. Figures 4, 5 and 6 show several alternative methods of introducing the necessary barrier to the entry of soil salts in this case. A variant of one of these methods was adopted and the stone was washed at intervals to remove salts already accumulated above the damp-proof course, and a year or so later an improvement was noticed, indicating that the source of trouble had been dealt with.

Figure 7 shows a method of construction which prevents the rise of soil salts from the ground and also obviates contamination and disfigurement by pavement splashings.

Decay due to salt-transfer from stone of one kind to another.—A special case of decay due to salt-transfer may arise when dissimilar stones are used in juxtaposition or under conditions such that salts derived from one kind of stone can be absorbed by another. Decay from this cause is

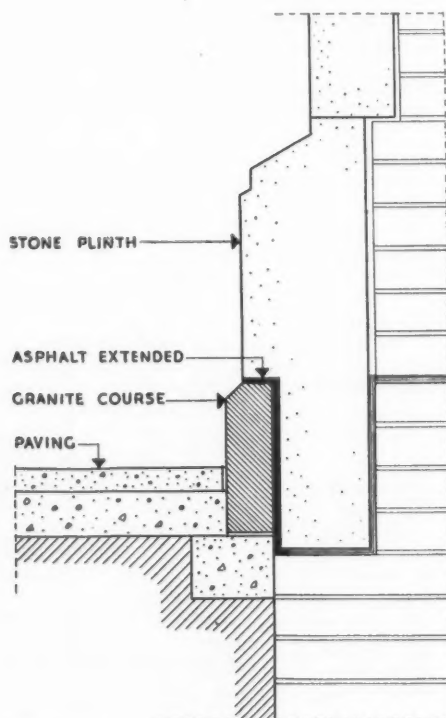


FIGURE 4. Cure for trouble shown in Fig. 3 by insertion of a course which does not absorb moisture from ground or from splashings.

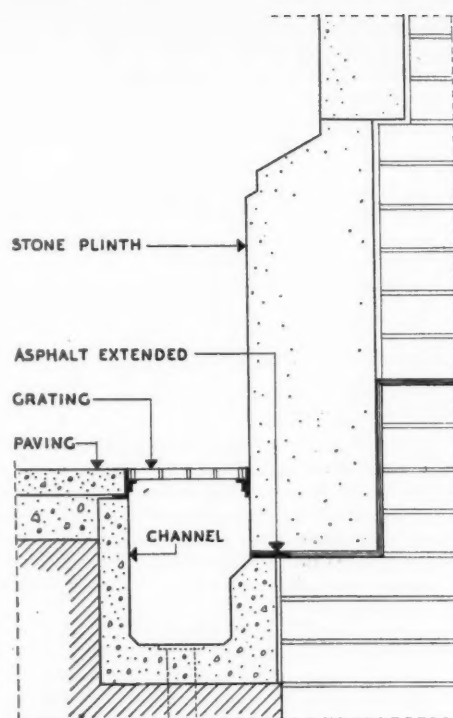


FIGURE 5. Cure for trouble shown in Fig. 3 by insertion of drained channel, thus preventing absorption of moisture from ground and from splashings. This design avoids troubles shown in Figs. 2 and 3.

rather rare but cannot be ignored. The use of sandstone and limestone in the same building provides an example.

It has been pointed out that those sandstones which do not contain carbonate of lime are insoluble in water and they rarely suffer from powdering. Most sandstones, however, are susceptible in rather a marked degree to injury by soluble salts. It will readily be appreciated that if sandstone is used in such a position that it receives the washings from limestones, it may be contaminated by salts resulting from the action of the atmospheric acids on the limestone and may then suffer powdering and decay. It may often be more injured than the limestone itself, for some limestones show a superior resistance to salt attack. This illustrates the need for caution in using dissimilar stones in a building. Comparable effects may be observed with other combinations but they are so rare as not to merit mention here.

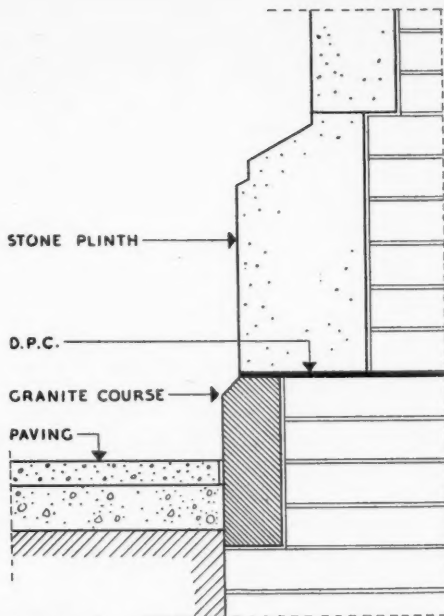


FIGURE 6. Cure for trouble shown in Fig. 2 by insertion of a course which does not absorb moisture from ground or from splashing. This design avoids troubles shown in Figs. 2 and 3.

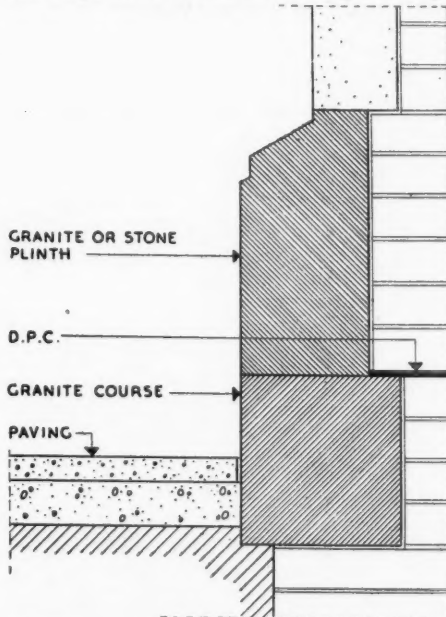


FIGURE 7. Design for construction to avoid troubles shown in Figs. 2 and 3. The non-absorptive course as in Fig. 6 also acts as part of the D.P.C.

4. Skin Formation

There is another type of "salt-action" which, instead of producing the powdering and pitting action previously described, causes an unpleasant and most disfiguring flaking of stone. This may be seen in a number of limestones. Sandstones in which the sand grains are bonded with carbonate of lime are also liable to skin formation and flaking.

As has been mentioned, limestones and certain of the sandstones are acted on by rain-water containing sulphurous products of combustion, and calcium sulphate is formed. When other salts are also present, such as those derived from the soil, backings, cement, etc., efflorescence and crumbling occur. When, however, calcium sulphate occurs alone, it forms a smooth and not very noticeable skin either on or just beneath the surface. This skin firmly cements soot and dirt to the surface and in time becomes impermeable, thus sealing the stone. Behind the skin, the stone will gradually disintegrate, due to moisture entering from the joints, and finally flaking will occur.

The more exposed the stone, the less likely it will be to suffer in this way, for the tendency will be for the calcium sulphate to be removed by washing and the effect will be merely a gradual roughening and wearing back of the surface. Different stones will vary according as their structure is such that calcium sulphate is more or less easily removed by washing.

This form of decay is not one which the architect or builder can control by design, except in so far as the entry of soluble salts from the soil, etc., has an influence. The primary cause is the action of polluted, i.e. acid, atmospheres upon limestones, or stones containing lime. Nor can much be done by selection of particular beds of stone or particular sorts of limestone. Rather it is to be regarded as an intrinsic property of large groups of limestones and is the inevitable result of the exposure of the stone in relatively sheltered positions in atmospheres charged with sulphurous products of combustion when the calcium sulphate produced by reaction between the atmosphere and the stone is allowed to accumulate. There is, however, a remedy. Sufficient time has not yet elapsed to say whether it is completely or only partially successful but certainly a marked retardation of this type of decay is possible. This remedy consists simply in washing buildings artificially. If a limestone building, before it has had time to get too dirty, is washed down with hoses twice a year, experience shows that this suffices to keep the work as clean as the rain-washed surface would be. The practice of periodic hosing has been adopted

at Goldsmiths Hall, Gresham Street, London, which is washed down twice a year. This building, after a century's exposure in a district of high atmospheric pollution, maintains a clean attractive appearance, while other buildings of only half its age in a similar situation are markedly blackened. It may also be mentioned that in order to maintain a good appearance and with the object of preservation, H.M. Office of Works have adopted the practice of regularly washing with water the masonry pedestals of the statues and memorials in their care.

It will be seen then that stone decay is a phenomenon in which atmospheric pollution, type of stone, and the design of a building all play a part. The first step in guarding against decay is the choice of a stone suited to the exposure and design, and the selection of the

most resistant and durable beds. Laboratory tests can afford considerable assistance in these respects and, as a matter of interest, it may be mentioned that the following tests are customarily used:—

Microscopical examination and comparison with type specimens of known properties (as regards weathering).

Measurements of pore space and tendency to saturation in exposed positions.

Crystallisation test.

A good stone having been selected there is much that the architect and builder can do to ensure that it attains the maximum life of which it is capable—which is usually very long.

The second part of the present note will deal with the preservation, cleaning and repair of natural stone masonry and with the selection of mortars for pointing.

The following notes have been published in the current series:

- No. 1.—The Design of Timber Floors to Prevent Dry Rot
- No. 2.—The Design of Concrete Floors to Reduce the Transmission of Sound
- No. 3.—The Cure of Smoky Chimneys
- No. 4.—External Rendered Finishes
- No. 5.—The Thermal Insulation of Buildings, Part I—General Principles

Copies of past issues can be obtained from the Royal Institute of British Architects, price 6d. a copy—for orders of more than six copies special rates will be given.

Librarian—Editor R.I.B.A.

